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SC Court of Appeals

**STATE OF SOUTH CAROLINA
ADMINISTRATIVE LAW COURT**

KDP II, LLC,)	Docket No. 18-ALJ-07-0047-CC
)	
Petitioner,)	
)	
v.)	ORDER
)	
South Carolina Department of Health and Environmental Control,)	
)	
Respondent.)	
_____)	

APPEARANCES: G. Trenholm Walker, Esquire
Thomas R. Gressette, Esquire
For Petitioner KDP, II, LLC

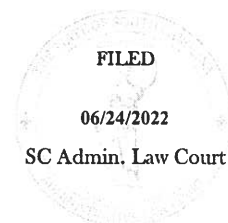
Sallie P. Phelan, Esquire
Bradley D. Churdar, Esquire
For Respondent South Carolina Department of Health and Environmental
Control

STATEMENT OF THE CASE

This matter is before the South Carolina Administrative Law Court (ALC or Court) pursuant to a request for a contested case hearing filed by Petitioner KDP II, LLC (Petitioner). Petitioner challenges a final decision issued by the South Carolina Department of Health and Environmental Control (Department) on December 6, 2019, establishing the baseline and setback line at Captain Sams Spit (Spit). A contested case hearing was held from August 24, 2021, through August 27, 2021. After careful consideration of the testimony, the exhibits, the applicable law, and the parties' arguments and proposed orders, the Court orders the baseline to be set at the place determined by the Department on remand. The setback line shall be set twenty feet landward of the baseline.

FINDINGS OF FACT

Having observed the witnesses and exhibits presented at the hearing and taking into consideration the burden of persuasion and the credibility of the witnesses, I make the following findings of fact by the preponderance of the evidence:



Background

Kiawah Island is a ten-mile-long barrier island in Charleston County, located between Seabrook Island and Captain Sams Inlet (Inlet) to the southwest and Stono Inlet and Folly Beach to the northeast. At the southwest end of Kiawah Island is the Spit, an undeveloped, piece of land that has about one mile of beachfront property. The Spit extends out from Kiawah Island by a narrow strip of land referred to as “the neck.” The Spit is a geomorphological landform called a downdrift spit. Downdrift spits commonly form off barrier islands where the longshore sediment transport system is pushing sand from north to south. The Spit is advancing in a southwesterly direction toward Seabrook Island.

The Spit is surrounded by water on three sides: the Atlantic Ocean to the east, Captain Sams Inlet on the southwest tip, and the Kiawah River on the backside. The Spit contains dune areas on the oceanside, a sandy brackish vegetation and marsh area along the backside next to the river, and a small inland maritime forest. Captain Spit has approximately one mile of oceanfront beach. Petitioner owns beachfront property of more than one-hundred fifty acres in the area known as Captain Sams Spit and also owns the land north of the Spit where the Charleston County Beachwalker Park is located. The South Carolina Sea Grant Program determined the Spit has an unstable shoreline from Beachwalker Park all the way down to the Inlet and it is considered to be an unstabilized inlet zone.

In 1988, the Beachfront Management Act (Act) was enacted to expand the 1977 Coastal Tidelands and Wetlands Act to enhance the ability of the Department in fulfilling legislative goals regarding South Carolina’s beach front and dune system. Section 48-39-280 of the South Carolina Code originally established a forty-year retreat policy from the shoreline and directed the Department to implement this policy utilizing the best available scientific and historical data. S.C. Code Ann. § 48-39-280 (2008). This section was later amended to set forth a policy of beach preservation. S.C. Code Ann. § 48-39-280 (Supp. 2021).¹ Subsection 48-39-280(A) required the

¹ When this contested was filed, the applicable law would be that which existed in 2017. In both 2018 and 2021, amendments were made to the Act with the most significant being the 2018 amendments (the Beachfront Management Reform Act) which were made during the pendency of the Department’s review in this case. Act No. 173 of 2018 implemented a policy of beach preservation. The 2018 amendments also provided the baseline must not be moved seaward from the most seaward of the location of the baseline established during the 2008 through 2012 establishment cycle, the location of the baseline as proposed by the Department on October 6, 2017, and the location of the proposed October 6, 2017, baseline as revised by the Department pursuant to a review or an appeal initiated before January 1, 2018. S.C. Code Ann. 48-39-280 (Supp. 2021). Act 173 also provided guidance to the Department for implementation of future line review processes, which will be initiated on or after January 1, 2024.

delineation of a baseline and setback line on beach front property along South Carolina's coastline. At the time of the Act's adoption, the width of the Spit was not sufficient for the creation of a setback line. *Kiawah Dev. Partners, II v. S.C. Dep't of Health and Envtl Control*, 411 S.C. 16, 766 S.E.2d 707 (2014). In 1999 and as part of the next cycle² for delineation of the baseline and setback line, the Department extended the lines for almost the entirety of the Spit. In 2009, the Department delineated a new baseline and setback line; while there were some differences, the line was virtually the same as it was in 1999.

In October 2017, the Department released its preliminary delineation of the jurisdictional lines for the Spit pursuant to the mandate in subsection 48-39-280(C). The baseline proposed by the Department on October 6, 2017, placed the line in essentially the same location as the two prior delineations. Specifically, the baseline position was comprised of a wet/dry shoreline position from 1983 and historical vegetation line positions from 1988 and 1998.

At the time of the Department's preliminary delineation in 2017, subsection 48-39-280(A) provided "the baseline established pursuant to this section must not move seaward from its position on December 31, 2017." S.C. Code Ann. § 48-39-280 (Supp. 2017). This was reiterated in subsection 48-39-280(C). *Id.* On November 3, 2017, the Department issued notice advising it was extending the public comment period for the proposed lines until April 6, 2018, and that the final revised jurisdictional lines would be published by December 31, 2018. Concerned the proposed line might become the final one, Petitioners (along with many other beachfront property owners) filed a Request for Final Review Conference on November 20, 2017, seeking the Department Board's review of the 2017 preliminary determination of the baseline.

By letter dated January 5, 2018, the Department declined to conduct a review conference. On February 5, 2018, Petitioner filed a Request for Contested Case Hearing with this Court.

On October 24, 2018, the Department filed a motion to dismiss the contested case hearing request arguing among other things that there was no final agency decision and Petitioner had not exhausted its administrative remedies. On March 28, 2018, this Court denied the motion noting no final decision had been rendered on the merits of Petitioner's reasons for requesting the seaward adjustment of the jurisdictional lines. With agreement of the parties, the Court issued an order on June 6, 2019, staying the proceedings at this Court and remanding the matter to the Department to

² Section 48-39-280(C) provides the Department must review and establish new jurisdictional lines not less than every seven years but not more than every ten years.

consider the merits of Petitioner's request that the jurisdictional lines be moved seaward of the proposed lines published on October 6, 2017. On remand, Petitioner offered an alternative 1988 vegetation line.

On December 6, 2019, the Department issued its final decision on remand that essentially left the Department's preliminary delineation of the jurisdictional lines unchanged except for a minor adjustment in one small location. The Department's final decision affirmed classification of the Spit as an unstabilized inlet erosion zone and determined the 1988 vegetation line (which was reviewed and modified on remand) represented the most landward point of erosion in the past forty years for purposes of setting the baseline.³

On December 23, 2019, Petitioner filed a request for a final review conference regarding the Department's Final decision on remand. By letter dated February 10, 2020, the Department's Board declined Petitioner's request for review. On March 6, 2020, Petitioner renewed its request for a contested case hearing and sought to have the Court lift the stay. By Order dated June 10, 2020, this Court lifted the stay and requested the parties file updated prehearing statements. A contested case hearing was held on the merits from August 24, 2021, through August 27, 2021. Just prior to the hearing, Petitioner argued the only issue to be adjudicated was determining the most landward point of erosion in the last forty years for purposes of establishing the baseline and setback lines.⁴

The Parties' Contentions as to the Location of the Jurisdictional Lines

The parties submit that in this case the baseline should be set "at the most landward point of erosion at any time during the last forty years," pursuant to subsection 48-39-280(A)(2). The Department maintains regulation 30-21(H)(2) of the South Carolina Code of Regulations clarifies subsection 48-39-280(A)(2) by providing the Department is to look for the most landward shoreline over the last forty years when determining the baseline. S.C. Code Ann. Regs. 30-21 (2011). The Department used a line of stable natural vegetation as a proxy for the shoreline, and to identify the most landward point of erosion in the last forty years.

³ The Court notes, however, that subsequent to the issuance of the final determination on remand, the Department located a 1982 aerial photograph that indicates an escarpment line that is nearly in the same location as the 1988 vegetation line (reviewed).

⁴ Prior to the hearing, Petitioner also maintained the Department failed to correctly determine whether the shoreline was unlikely to return to its former position pursuant to subsection 48-9-280(A)(2), and the Spit's zone designation. As to the latter, Petitioner originally contended the zone designation for much of the Spit should be changed from an unstabilized inlet erosion zone to a standard erosion zone.

While simplified and discussed in more detail below, the Department arrived at the baseline's placement by reviewing a 1988 aerial photograph to set the baseline at the location of a line of established vegetation that it contends was a proxy for the most landward position of the shoreline in the last forty years. The Department states this methodology is delineated by regulation 30-21(H)(2). Finally, the Department submits erosion of the neck on the Kiawah River and behind the Spit and general policy considerations are pertinent to the delineation of the baseline and permitted under subsection 48-39-280(A)(2).

Petitioner submits subsection 48-39-280(A)(2) and regulation 30-21(H)(2) conflict as the most landward point of erosion is not synonymous with the most landward position of the shoreline. Petitioner states the statute which mandates the baseline be set at the most landward point of erosion in the last forty years is controlling. Petitioner asserts the Department's location was not only not the most landward point of erosion but also that it does not reflect the true location of the shoreline on the 1988 aerial photograph. Petitioner further asserts because the beach is accreting, the shoreline of the Spit does not constitute a "point of erosion" and thus, the Department should not have considered the shoreline as a point of erosion. Petitioner contends the most landward point of erosion over the last forty years is a post-Hurricane Matthew shoreline or one reasonably approximate to it, specifically a 2017 post-Irma⁵ escarpment line.

With regard to the setback line, subsection 48-39-280(B) provides in part that:

[A] setback line must be established landward of the baseline a distance which is forty times the average annual erosion rate or not less than twenty feet from the baseline for each erosion zone based upon the best historical and scientific data adopted by the department as a part of the State Comprehensive Beach Management Plan.

The parties agree the setback line should be placed twenty feet landward of the baseline, and so the setback line is not in contest.

Legislative Mandate for the Establishment of a Baseline and Setback Line

The Act recognizes the substantial value of South Carolina's coastal environment including its beaches and dunes. The General Assembly has enacted expansive legislation designed to manage and protect it and has delegated powers and duties to the Department to implement this

⁵ There was no definitive testimony as to whether Irma was a tropical storm or a hurricane. The parties used both terms when referring to Irma.

legislation. S.C. Code Ann. §§ 48-39-10 through -360 (2008 and Supp. 2021); S.C. Code Ann. Regs. 30-1 through 30-21 (2011 and Supp. 2021).

Subsection 48-39-280(A) of the South Carolina Code establishes a policy of beach preservation and directs the Department to utilize the best available scientific and historical data in implementing this policy. Subsection 48-39-260(A) further directs the Department to establish a baseline that parallels the shoreline for each standard zone and each inlet erosion zone.

The Act defines two types of zones for coastal areas: standard erosion zones and inlet erosion zones.⁶ The latter are further divided into unstabilized and stabilized. The zone determination governs how the baseline is to be set at a particular location. *See* S.C. Code Ann. § 48-39-280(A)(2) (Supp. 2021); S.C. Code Ann. Regs. 30-21(H)(1) (2011).

Subsection 48-39-280(A)(2) sets forth how the baseline should be established in an unstabilized inlet erosion zone:

The baseline for inlet erosion zones that are not stabilized by jetties, terminal groins, or other structures must be determined by the department as the most landward point of erosion at any time during the past forty years,⁷ **unless** the best available scientific and historical data of the inlet and adjacent beaches indicate that the shoreline is unlikely to return to its former position. In collecting and utilizing the best scientific and historical data available for the implementation of the beach preservation policy, the department, as part of the State Comprehensive Beach Management Plan provided for in this chapter, among other factors, must consider historical inlet migration, inlet stability, channel and ebb tidal delta changes, the effects of sediment bypassing on shorelines adjacent to the inlets, and the effects of nearby beach restoration projects on inlet sediment budgets.

(emphasis added). Thereafter, the setback line must be established at a distance of forty times the annual erosion rate (or at least twenty feet) from the baseline. S.C. Code Ann. § 48-39-280(B) (Supp. 2021); S.C. Code Ann. Regs. 30-21(H)(2) (2011). Here, the parties concur the setback line should be established twenty feet from the baseline.

⁶ Subsection 48-39-270(6) defines a “standard erosion zone” as “a segment of the shoreline which is subject to essentially the same set of coastal processes, has a fairly constant range of profiles and sediment characteristics, and is not influenced directly by tidal inlets or associated inlet shoals.” S.C. Code Ann. § 48-39-270 (2008). Subsection 48-39-270(7) defines an “unstabilized inlet erosion zone” as “a segment of shoreline alone or adjacent to tidal inlets which is influenced directly by the inlet and its associated shoals.” *Id.* See also S.C. Code Ann. Reg. 30-21(H)((1) (2011).

⁷ Regulation 30-21(H)(2) further provides in unstabilized inlet erosion zones, the baseline is simply the most landward position of the shoreline in the most recent forty years. This is determined by the Department using representative aerial photography. *Id.* The Department maintains regulation 30-21(H)(2) is merely an amplification of subsection 48-39-280(A)(2). Petitioner argues regulation 30-21(H)(2) conflicts with subsection 48-39-280(A)(2) which states the baseline must be set at the most landward point of erosion in the last forty years.

Subsection 48-39-280(E)(1) provides further directive: “In order to locate the baselines and the setback lines, the department must establish monumented and controlled survey points in each county fronting the Atlantic Ocean. The Department must acquire sufficient surveyed topographical⁸ information on which to locate the baselines.” Subsection 48-39-280(E)(2) continues in part by stating the data surveys from these stations must locate the crest of the primary oceanfront sand dune to be used as the baseline for computing the forty-year erosion rate.”⁹ Regulation 30-21(B)(7)(a)(i) further provides that to improve the data base of coastal processes, “A monitoring program must be developed to periodically survey beach profiles along the coast. Each station will be surveyed at least twice each year.”

To that end, the Department has established thirty-five survey points at Kiawah including the Spit. Monument 2620 is slightly to the southwest of the neck of the Spit, and Monument 2625 is to the northeast of the neck on the far side of Beachwalker Park. The area beginning at OCRM Monument 2625 and extending to the Inlet is classified as an unstabilized inlet erosion zone.

Finally, in 2021 and while this matter was under review by the Department, subsection 48-39-280(4) was amended to provide the location of a baseline established pursuant to section 48-39-280 may not move seaward from the most seaward location of the proposed October 6, 2017, baseline as revised by the Department pursuant to a review or an appeal initiated before January 1, 2018.

The Shoreline is Unlikely to Return to its Former Position

The Court must first determine whether the shoreline at the Spit is unlikely to return to its former position. The Department states the best evidence indicates the shoreline is “not unlikely” to return to its former position and Christopher Jones, B.S., M.S., P.E.,¹⁰ the Department’s expert,

⁸ Topography is defined as “the art or practice of graphic delineation in detail usually on maps or charts of natural and man-made features of a place or region especially in a way to show their relative positions and elevations.” *Merriam-Webster's Online Dictionary*, <https://www.merriam-webster.com/dictionary/topography> (last visited March 18, 2022).

⁹ The 1990 Coastal Science & Engineering, Inc. report prepared for the South Carolina Coastal Council outlining how the jurisdictional baselines and set back lines should be established, echoes this. Referring to the Department, the report states:

This agency will develop a comprehensive compilation of state plane coordinates for various positions along these jurisdictional lines. These coordinate points will be given to the surveying community on demand, and using the monument system and standard surveying techniques, the locations of these lines may be placed on the property owner’s plat.

This, however, pertains to the setback line and because the parties agree to a setback line of twenty feet behind the baseline, the Court need not engage in an analysis of utilizing the monument data to establish an erosion rate for purposes of setting the setback line.

¹⁰ Jones has a Bachelor of Science in Engineering Sciences and a Master’s Degree in Coastal and Oceanographic Engineering with a focus on coastal processes of tidal inlets. He is a registered professional civil engineer in both

agreed. Jones did not provide the basis for his opinion, but the Department's final decision of December 6, 2019, states in part:

The mouth of Captain Sams Inlet naturally migrates in a southwesterly direction towards Seabrook Island. However, inlet relocation projects in 1983, 1996, and 2015 have moved the inlet mouth back towards Kiawah Island. These inlet relocation projects have resulted in Captain Sams Inlet and the adjacent shorelines being maintained in approximately the same position over time ...

While it may be a matter of semantics, it appears to the Court that the Department is stating the shoreline is essentially likely to return to its former position. Petitioner initially took issue with this but on the eve of the contested case hearing, withdrew this contention.¹¹ As such, both parties submit the test to be utilized in setting the baseline is the most landward point of erosion at any time during the past forty years for the reason that the shoreline is "not unlikely" to return to its former position. The Court disagrees.¹²

Here, the best available scientific and historical data¹³ relating to the inlet and adjacent beaches indicate by a preponderance of the evidence that the shoreline is unlikely to return to its

South Carolina and North Carolina. Jones has over forty years of experience in coastal engineering including coastal processes and coastal zone management. He also has extensive experience as pertains to the issues in this case. In South Carolina, Jones has experience in conducting shoreline assessments including looking at inlet dynamics and erosional processes and proposed local comprehensive Beachfront Management Plans that were required by the State of South Carolina. When the Beachfront Management Act was first enacted, the South Carolina Coastal Council retained Coastal Science & Engineering, Inc. to establish the interim baselines and setback lines, as well as the methodology to be used in establishing those lines; Jones led this team. Jones was qualified as an expert in coastal engineering, coastal management, and more specifically consideration of storm impacts and coastal processes, which includes tides, waves, current, sediment transport, shoreline change and tidal inlets. The Court finds Jones was eminently qualified to testify in this case and placed a great deal of weight on his testimony given his issues specific experience.

¹¹ While Petitioner takes the position it placed no evidence in the record as to whether the shoreline is unlikely to return to its former position, it did so by presenting extensive evidence the Spit is accreting seaward and migrating toward the south. If the Spit is accreting, the shoreline is unlikely to return to its former position.

¹² The parties' agreement that the most landward point of erosion is the test to be utilized, cannot circumscribe the Court's fact-finding authority or prevent the Court from employing what it believes to be a proper application of the law on an issue before it. Here, both parties presented evidence the shoreline was unlikely to return to its former position including evidence pertaining to the Spit's accretion, erosion, and movement over time, and inlet relocation projects.

¹³ Subsection 48-39-280(A)(2) commands the best scientific and historical data available be utilized in determining whether the shoreline is unlikely to return to its former position and to effectuate the policy of beach preservation. The subsection further provides:

In collecting and utilizing the best scientific and historical data available for the implementation of the beach preservation policy, the department, as part of the State Comprehensive Beach Management Plan provided for in this chapter, among other factors, must consider historical inlet migration, inlet stability, channel and ebb tidal delta changes, the effects of sediment bypassing on shorelines adjacent to the inlets, and the effects of nearby beach restoration projects on inlet sediment budgets.

Petitioner concedes this is applicable when the shoreline is unlikely to return to its former position.

former position as evidenced by an analysis of the factors set forth in subsection 48-39-280(A)(2). Specifically, the Court concludes the shoreline is unlikely to return to its former position based upon the overall decrease in the dune field at the neck; the Spit's vulnerability to a breach at the neck; the migration and movement of the Spit; and the fact that there is no certainty that Inlet relocation projects will continue into the future.

Shoreline Change

An assessment of the shoreline on both the oceanside and riverside is necessary to assess whether the shoreline is unlikely to return to its former position for purposes of establishing the baseline and set back line. Shoreline change rates¹⁴ are relevant to assessing inlet stability.

- Long-Term Rates of Accretion on Oceanside

Jones collected all the shoreline change rates that had been calculated by others in the Spit's neck area as well as around Monuments 2620 and 2625. He created a location map to show the relative positions of the various survey monuments and transect locations that have been used in studying the shoreline. Jones also made some independent calculations on the shoreline change rate. He then compared all the shoreline change rates and computed an overall average shoreline change rate on the oceanside and on the riverside of the Spit. Jones found that long-term accretion rates at Monument 2620 were 6.2 feet per year on average. At Monument 2625 (the monument at Beachwalker Park), Jones found an average long-term accretion rate of 4.4 feet per year.

The parties agree, the evidence supports, and the Court finds there is a long-term trend of accretion or rather positive average shoreline change rate on the oceanside at the Spit.

- Riverside Erosion

The Department also looked at shoreline change on the narrow neck area of the spit where the critical areas are coming together to evaluate whether the shoreline is unlikely to return to its former position and to evaluate the overall stability in the area. Jones explained that "if we're trying to characterize shoreline change in the neck area, we want to see what's going on across the entire neck, not just the ocean shoreline. If we were to focus purely on the ocean shoreline, we would think that life was wonderful and things were growing and we wouldn't have any problems, but we do in fact have . . . erosion problems on the landward side of that area."

¹⁴ A shoreline change rate is the amount of change in the shoreline position per year. A negative shoreline change rate means the shoreline is eroding while a positive one means the shoreline is accreting.

To that end, Jones calculated an average erosion rate for the riverside in the same manner as he did for the oceanside. Jones used change rates calculated by John Byrnes (a professional land surveyor retained by Petitioner) from critical area line surveys, and by Coastal Science and Engineering, Inc. using both survey data and aerial photography. He also used measurements the Department made at his request showing the riverside position between 1982 and 2021. Averaging the data which ranged from -6.4 to -15.4 feet per year, Jones calculated an average erosion rate at the neck on the riverside of -7.2 feet per year.

During Jones' site visit in July 2021, he documented the effects of this rapid erosion of the riverside shoreline through photographs he took along the back of the dune field. These photographs depict erosion on the river shoreline causing trees to die and fall into the river as well as the vegetation collapsing onto the eroding shore.

It is undisputed that the riverside of the Spit is experiencing chronic erosion. Ray Pantlik, B.S., who is employed by Petitioner as its Director of Development, testified to this chronic erosion in the case brought by the South Carolina Coastal Conservation League challenging the issuance of a permit to build a sheet pile wall on the riverside and subdivision. He testified there had been eight years of "unabated erosion" Petitioner had tried to stop and that would continue. He further testified that just as the beach builds on the oceanside, the river would continue to erode. He explained: "every day there's erosion on the river side at Captain Sams Spit. And there's beach building on the ocean side. So, every day there's a different answer to the question of how big Captain Sams Spit is." Pantlik also admitted that the critical area is moving closer to the present jurisdictional setback area. Pantlik's testimony in the sheet pile wall case highlights the extremely dynamic nature of the Spit.

Based on the testimony and evidence presented, Jones' review and assessment of shoreline rates on the oceanside and riverside are thorough and comprehensive. Despite high periods of accretion on the oceanside, the riverside steadily continues to erode.

Given the narrow area at the Spit's neck, the oceanside and riverside shoreline change rates should be considered in determining "whether the shoreline is unlikely to return to its former position" and in considering "inlet stability" pursuant to subsection 48-39-280(A)(2). Similarly, consideration of the close proximity between the riverside and the oceanside critical areas is a reasonable and necessary component to the analysis and in accordance with the statutory directive to formulate a comprehensive beach erosion, preservation, and protection policy including the

protection of necessary sand dunes. See S.C. Code Ann. §§ 48-39-30(B)(1)-(4) and -280(A) (2008 and Supp. 2021).

Decrease in the Dune Field Width at the Neck

The parties agree there is a long-term trend of accretion or rather, a positive average shoreline change rate on the oceanside. After averaging the data sets collected, Jones' shoreline change rate assessment indicated 5.8 feet per year of accretion on the oceanside, and -7.2 feet per year of erosion on the river side at the neck transect. This equates to an overall loss of -1.4 feet per year in the neck area at the Spit.

Jones also looked at measurements made from aerial photographs to compare the shoreline changes on the oceanside and riverside. At his request, the Department measured aerial photographs from the 1982 riverside shoreline to the riverside shorelines depicted on later dated aerials through 2021. Jones also had the Department measure from the 1982 riverside shoreline to the ocean edge of the dune field on aerials from 1982 to 2021. Eight aerial photographs dated 1982, 1993, 1998, 2006, 2011, 2015, 2017 and 2021, were used for this evaluation. These aerials were either georeferenced¹⁵ or georectified¹⁶ making them usable for mapping purposes. Jones then calculated the dune field width for each date.¹⁷ Jones then plotted the movement of the riverside escarpment, the oceanside dune edge, and the dune width using both end point and linear regression methods. He then calculated the shoreline change rates from this data.

Jones' assessment using the linear regression method, indicates the riverside had a steady, linear erosion rate of -7.1 feet per year. There were no periods of accretion on the riverside. The oceanside of the dune edge was accretional with some periods of erosion¹⁸ netting an accretion rate of 5.8 feet per year. This results in a trend in the reduction of the dune field width by -1.3 feet per year. Jones explained:

Over time, the width of the dune field in this neck location is gradually getting smaller. So, the erosion on the river side is slightly greater than the accretion on the ocean side ... This is consistent with the aerial photos we saw where the entire

¹⁵ An image is georeferenced when it is tied to a known Earth coordinate system, making it usable for mapping.

¹⁶ An image is georectified when it has been accurately adjusted to a known Earth coordinate system, and distortions associated with terrain, collection platform, and sensor are removed, making it useable for mapping.

¹⁷ The Department measured the distance between the 1982 riverside escarpment to each subsequent year's riverside escarpment. The Department also measured the distance from the 1982 riverside escarpment to each subsequent year's oceanside dune edge. Jones calculated the difference between these two measurements to obtain the dune field width for each date.

¹⁸ Jones testified there was an erosional period in the 2015 to 2017 time period. Jones mistakenly testified there was some evidence of slight erosion in the late 1990s but corrected this misstatement.

spit is migrating, because of erosion on the back side and accretion on the front side. As part of that migration process, the dune-field width is getting smaller.

Using aerial imagery, measurements taken from the riverside escarpment to the edge of the dune field on the oceanside show that the width of the dune field decreased from three-hundred and twenty-two feet in 1982 to two-hundred and thirty-five feet in 2021. The Spit's neck has narrowed by approximately eighty-seven feet.

John A. Hodge, B.S., M.S., J.D.,¹⁹ Petitioner's expert, also assessed the dune width at the Spit's neck at three locations for the period of 1988 to 2020. Jones reviewed the data collected by Hodge and also included Hodge's data from an additional period of 1979 through 1987, and then plotted the trend line using linear regression. Using Hodge's analysis, Jones found that the Spit's neck has narrowed by an average of 2.0 feet per year, thus using Hodge's information to corroborate that the neck is getting narrower over time. Petitioner presented evidence that the width of the neck increased from 1982 to 2015, although this evidence excluded the erosional period that occurred after 2015.

For purposes of placement of the baseline the statute requires the Department to look at inlet stability and whether the shoreline is unlikely to return to its former position. The applicable statutory and regulatory language does not allow the arbitrary exclusion of periods of storms when considering the location for the baseline in unstabilized inlet erosion zones²⁰ and expressly mandates a forty-year window to be examined. The entire forty-year window should be used since storms are natural events that occur regularly and since they greatly influence inlet stability and the shoreline.

Jones' testimony confirmed this:

I always tell students not to focus on the long-term shoreline change rate. It's important, but it's not the only thing we need to look at. It's usually the storms and the short-term changes ... that [cause] the greatest change and a lot of damage.

¹⁹ Hodge has a Bachelor of Science in Geology, a Master's Degree in Marine Science/Geology, and a Juris Doctorate. He also has a Certificate in Planetary Geology. Hodge focuses on environmental work, and was qualified as an expert in the areas of geology, coastal geology, and coastal processes.

²⁰ Subsection 48-39-280(E)(4) directs the Department to exclude storm information to locate the crest of the primary dune for purposes of establishing the baselines in standard erosion zones and stabilized inlet erosion zones pursuant to subsections 48-39-280(A)(1) and (A)(3). This section omits, however, unstabilized inlet erosion zones pursuant to subsection 48-39-280(A)(2).

The fact that the dune field has narrowed at the neck over an almost forty-year period²¹ (despite engineered inlet relocations which are discussed below) is evidence the shoreline is unlikely to return to its former position.

Historical Migration and Inlet Stability

Historically, as the Spit and Inlet migrate, the Spit elongates and narrows leading to an eventual breach where water cuts across the neck area. The Spit then re-forms, starting the cycle again. Jones explained:

That cut will be from a storm. Usually, the high tide and the waves attack the front side of the beach, they carry sand across into the river. With many storms, we have a lot of rainfall, and the high tides on the river side ... are trying to get back to the Atlantic Ocean and they usually take advantage of whatever channels that have been cut across that spit. So, it's a combination of waves and high tides on the ocean side and river discharge on the back side that cause the breach to form.

This process is evidenced in aerial photographs taken prior to and after Hurricane Gracie that made landfall on the South Carolina coastline at low tide.

Jones testified the greater the storm tide and wave conditions, the greater likelihood dunes will be eroded, the Spit will be inundated, and new inlet formed at the neck:

If I reduce the coastal processes of this site down to two things, the first is, we've got a lot of sand that comes on to the east end of Kiawah Island from Stono Inlet from the sand bars. And that sand washes down the beach towards Captain Sam's (sic) Spit, and the spit – the ocean side accretes because of that sand. The second thing that really controls what happens on the shoreline is storms [that] erode that sand. So that's what all of this comes down to is, it's a battle between sand supply and storms. And the more severe the storm, the greater the likelihood we're going to see erosion of the spit, we're going to see a new inlet form at the neck.

The Spit has breached at the neck on three occasions: 1822, 1922, and 1949. Miles O. Hayes, B.A., Ph.D., a coastal geomorphologist to whom both Hodge and Jones referenced at the hearing, estimated that the Spit would breach on a forty-to-eighty-year cycle although to date, the cycle has been both much shorter and then longer.

Although Petitioner presented evidence of other storms since Hurricane Gracie that have not resulted in a breach of the neck, the Court does not find this persuasive given the neck continues to narrow and the Inlet has breached several times in the past. Additionally, the National Hurricane Center did not define Hurricane Matthew as a major storm when it passed Kiawah based upon its

²¹ Even if the Court were to exclude measurements taken after the last delineation cycle in 2017, the neck still narrowed.

intensity, central pressure, wind speed, and storm surge. Likewise, Irma was not a major storm when it passed the South Carolina coastline.²²

The Department evaluated historical aerial imagery and used Timelapse Google Earth to evaluate the Spit through time to determine the proper baseline position by considering historical inlet migration and inlet stability. While there is a positive long-term shoreline change rate, the Spit is not growing and getting larger, but rather, the entire spit is migrating to the south and narrowing. Jones explained, “The marsh grew on one side, and the backside of Kiawah’s spit eroded on the other.” See Department Exhibits 48²³ and 49.²⁴ The Inlet has migrated to a number of different locations over time and the entire Spit goes through periodic cycles where it elongates and moves toward Seabrook. The cyclic effect²⁵ impacts the stability of the Inlet and whether the shoreline is unlikely to return to its previous position.

Inlet Relocation Projects

Seabrook Island Property Owners Association hired Coastal Science & Engineering, Inc. to relocate the Inlet three times (in 1983, 2006, and most recently, in 2015) to its approximate 1963 location to help alleviate erosion on Seabrook Island. The relocations of the Inlet were accomplished by creating a dam of sand to close off the Inlet’s existing position and block the Kiawah River from flowing out to the ocean in that location. A new inlet is cut to the north in the approximate position the Inlet had been in 1963 allowing water to flow out of the newly-formed inlet. These relocation projects allow the sand that is detached from Kiawah Island to migrate and weld to Seabrook Island to help solve erosional issues on their coastline, and also contribute to the accretion of sand on the Spit’s oceanside. These engineered relocations of the Inlet significantly alter the Spit’s coastal processes. There was no testimony, however, that regular relocations of the inlet would continue in the future.

²² Nevertheless, both storms caused damage. Pantlik testified he observed over-washes, evidence of erosion and pieces of boardwalk after both Matthew and Irma. He testified Matthew destroyed approximately one-hundred feet of dunes and a survey showed the primary dune was lost.

²³ Department’s Exhibit 48 is a 2021 orthorectified drone image that evidences how the shoreline on the riverside has moved between 1982 and 2021. The Kiawah River has shifted and cut into the dune field on the back side of the Spit.

²⁴ Department’s Exhibit 49 is a 1982 image from the National Park Service and is visually similar to Department’s Exhibit 48 in that it indicates the Kiawah River has migrated as has the Spit to the south.

²⁵ The cyclic effect is also evidenced by a historical chart from a 2009 Coastal Science & Engineering, Inc. report analyzing the potential impact of relocating the Spit. The chart contains ten images from 1696 through 1979. None of the images indicate a similar shoreline and in 1822, the Spit is not even visible. Both Hodge and Jones referenced this chart.

Establishment of a Baseline When the Shoreline is Unlikely to Return to Its Former Position
The Standard for Establishing a Baseline When the Shoreline is Unlikely to Return to Its Former Position

As noted by Petitioner, subsection 48-39-280(A)(2) does not set forth the standard for determining the placement of the baseline for an inlet erosion zone that is not stabilized by jetties in the instance when the shoreline is unlikely to return to its former position. Regulation 30-21(H)(2) which was enacted in 1993, however, provides that “in Unstabilized Inlet Erosion Zones the baseline is simply the most landward position of the shoreline in the most recent 40 years.” Regulation 30-21(H)(2) continues by stating the most landward position of the shoreline is to be determined using representative aerial photography.

In 1988, Coastal Science and Engineering, Inc. prepared a report captioned, “Calculation of Interim Baselines and 40-Year Setback Lines,” for the South Carolina Coastal Council with the purpose of setting the baseline and setback line in the first review cycle and thereafter. This report delineated the methodology to be utilized in setting interim baselines and setback lines during the first review cycle.²⁶ While the report does not specifically set forth the methodology to be utilized if the shoreline is unlikely to return to its former position, it does state the procedure for establishing the most landward shoreline in the past forty years along unstabilized inlet erosion zones relying upon historic vertical aerial photographs and historic shoreline charts with a preference for the former.

This utilization of aerial photography to establish jurisdictional lines was further documented by Coastal Science & Engineering, Inc. in May 1990 in a report captioned, “Calculation of South Carolina Coastal Council Jurisdictional Baselines and Setback Lines, Kiawah Island.”²⁷ The report stated in part, “[a]erial photographs from 1949, 1954, 1957, 1963, 1983 and 1988 were used by CSE to determine erosion rates and **the most landward shoreline.**” (emphasis added.)

As the shoreline is unlikely to return to its former position, the Court finds the test to be used in establishing the baseline is the most landward position of the shoreline in the last forty

²⁶ The South Carolina Coastal Council adopted the interim lines proposed by Coastal Science & Engineering, Inc., and the Department continues to generally use the methodology outlined in the report.

²⁷ Coastal Science & Engineering, Inc. prepared this report for Kiawah Resort Associates.

years as set forth in regulation 30-21(H)(2). This is to be determined utilizing representative aerial photographs.

Here, there was extensive testimony regarding modern and historic shorelines,²⁸ and the aerial photography used to determine the most landward position of the shoreline in the last forty years. In fact, in this case, Petitioner criticized the Department stating that it improperly set the baseline at the most landward position of the shoreline (rather than the most landward point of erosion) over the last forty years.

While Petitioner's argument was primarily limited to the most landward point of erosion, it used a post-Hurricane Matthew shoreline or one reasonably approximate to it, specifically a 2017 post-Irma escarpment line, as the most landward point of erosion in the last forty years.²⁹ Much of Petitioner's evidence focused on assessing and verifying the post-Irma line. Even as it pertains to the most landward point of erosion which Petitioner (and the Department) advocated as the test for setting the baseline, Petitioner considered only recent imagery rather than historic shorelines within the entire forty-year window. In fact, even though Petitioner was advocating that the baseline should be set at the most landward point of erosion in the last forty years, the only post-storm Global Position System (GPS) survey its expert reviewed in the entire forty-year window was the one following Irma in 2017.

Location of the Most Landward Shoreline Using Vegetation as a Proxy

Both parties' expert witnesses testified to the use of a seaward line of stable natural vegetation as a shoreline proxy. Hodge stated the vegetation line is not the shoreline but the vegetation "is a proxy for the shoreline" or "an indicator for the shoreline." One of the reasons the Department utilizes proxies is because it does not have continuous and ongoing survey information dating back in time.

Hodge testified the vegetation was a good indicator of whether a shoreline is accreting or eroding. Jones testified extensively about proxies used to track shoreline changes and similarly stated that a vegetation line (in addition to an escarpment) was appropriate to track shoreline

²⁸ The Department's position is that the shoreline is not unlikely to return to its former position and therefore, maintains the baseline should be set at the most landward point of erosion. The Department used modern and historic vegetation shorelines as proxies, however, to determine the most landward point of erosion.

²⁹ Petitioner's second updated prehearing statement stated, "Because the best available scientific and historical data demonstrate that the beachfront of the [Spit] is accreting over the long term rather than eroding, the post-Hurricane Matthew shoreline or one reasonably approximate to it, specifically the post-Irma escarpment line, or the shoreline at the effective date of the determination is the most landward point of erosion over the last 40 years."

change especially for purposes of tracking long-term shoreline change because it is reasonably stable: it neither moves with every tide cycle nor is it so far inland the waves never reach it. A line of stable natural vegetation indicates the area is not being consistently inundated with salt water. This is why a line of stable natural vegetation will not grow on an active beach. Both Hodge and Jones said the use of a line of stable natural vegetation as a shoreline proxy is a valid method accepted in the coastal science community and is recognized as such in scientific peer-reviewed literature. This being the case, the Court finds that vegetation lines are well-established proxies for the shorelines, and that aerial photography is reasonable and necessary in examining much of the forty-year window in determining the most landward position of the shoreline.

Jessica Boynton, B.A., M.A., who is employed with the Department as a shoreline specialist and team lead for the coastal services section, concurred with Hodge and Jones. Boynton has an advanced degree in biology with an emphasis in remote sensing³⁰ and has extensive experience in remote sensing, Geographic Information Systems (GIS)³¹ data collection, analysis and management, and GPS.

Boynton testified the Department used aerial photography to determine the position of historical vegetation lines and a Trimble GeoXT GPS to collect information on modern lines. The Department identified through analysis of historical aerial photographs (including those of vegetation and wet/dry shorelines) and the use of a Trimble GeoXT GPS unit,³² nine shorelines (vegetation and/or wet-dry shorelines). Those lines were in 1982, 1988 (reviewed), 1993, 1998, 2006, 2011, 2015, 2016, and 2019 with the most landward being the 1988 line.

The Department then digitized and placed these vegetation lines onto a 2021 drone image using a GIS platform in which multiple data sets can be overlaid on top of one another resulting in Respondent's Exhibit 18. Petitioner questioned the foundation for the lines and their accuracy as the Department derived its baseline from the utilization of these lines. Some of the lines were derived from the Department's historical inventory including the 1988 line which had been digitized by Department staff over the years. Boynton testified in detail about how each of the

³⁰ Remote sensing is the scanning of the earth by satellite or a high-flying aircraft in order to obtain information about it. The information is collected in a grid like pattern of pixels called raster data. An example of this would be aerial imagery.

³¹GIS is a type of database containing geographic data combined with software tools for managing, analyzing, and visualizing those data collection and processing techniques. One can bring different data sets into GIS and overlay them to perform various analyses.

³² A Trimble GeoXT is a handheld GPS unit. The 2016 and 2019 lines were collected using this device.

nine lines was digitized including their original sources. Mathew Slagel B.S., M.A.,³³ who is employed with the Department, digitized the 1982 line which was then reviewed by Boynton on a 1982 aerial image for accuracy. As to the 1988 (reviewed) line which the Department submits is the appropriate placement of the baseline in this case, Boynton testified that she along with Slagel and the Jurisdictional Line Review Committee³⁴ reviewed the line on the original imagery, and then made some modifications using modern technology and software to produce the line depicted on the 2021 drone image. Boynton provided foundation for the remaining lines shown on the exhibit including other historical lines that were first overlaid on their source imagery prior to their placement on the 2021 drone image. The Court finds the lines were positionally accurate and properly digitized in their correct locations. Petitioner failed to establish it was not provided with the imagery source and underlying data and data points source for the lines reviewed by the Department for purposes of establishing the baseline and set back line.³⁵

Boynton testified the most landward line was a combination of the 1982 and 1988 shorelines.³⁶ Slagel testified based on his visual observations, the 1982 line and the 1988 vegetation line were in substantially the same location. Slagel identified what he believed to be evident in the 1982 photograph, “a clear escarpment had been cut into the beach”³⁷ at the neck of the Spit in the same vicinity as the vegetation line. Boynton testified similarly stating the 1982 image showed a “very clear line of stable natural vegetation” and “some evidence of escarpment” going from the active beach on the oceanside moving landward. Slagel then digitized the 1988 vegetation line (reviewed) on the 1982 image that coincided with the escarpment line.³⁸ The

³³ Slagel has a bachelor’s degree in environmental sciences and a master’s degree in ocean science. He has frequently digitized both vegetation line data and wet/dry shoreline data from imagery and has participated in updating the baselines and setback lines in both the 2009 and 2017 cycles.

³⁴ The committee is internal to the Department and comprised of Department staff and managers with a variety of backgrounds. Members hold degrees in geology, marine sciences, ocean sciences, biology, and environmental science among others.

³⁵ This case was extremely contested, and dates back to 2017. While Petitioner and its expert attempted to cast dispersion as to whether the underlying data for the lines was provided to Petitioner, the Court notes that at no time has Petitioner ever filed a motion requesting the Court compel the Department to provide additional source information.

³⁶ Originally, the Department also considered part of a 1983 wet/dry shoreline but it later fell out on remand.

³⁷ Hodge testified an escarpment line was one of the geomorphic expressions of erosion necessary to show a point of erosion.

³⁸ Slagel also testified there were a series of nor’easters that occurred in the 1980’s that were documented to have eroded the dunes on Kiawah Island (so as to coincide with the 1988 escarpment line to which Slagel attested). The Court is not persuaded by this particular testimony as Slagel did not refer to dates, the sources of this information, or provide any of the documented erosion data. The Court finds this testimony speculative. Also, even if there was no escarpment line visible in the 1982 photograph, the Court’s placement of the baseline would still be the same as no

Department then compared the 1982 photograph with the line that had been digitized for the 1988 vegetation line (reviewed) and determined the lines were nearly identical along the neck of the spit and very similar along the length of it.

Andrew Tolleson, P.E., D.G.E.,³⁹ Petitioner's expert, testified it would not be possible for one to detect an escarpment with the naked eye on a flat piece of media since an escarpment is a vertical displacement.⁴⁰ While Petitioner challenged Slagel's "naked eye" analysis, Tolleson testified earlier, "the human eye is very, very good." Tolleson is certainly an expert in his field, but there was no testimony that he was accustomed to discerning coastal features such as escarpments. Finally, and as will be discussed more fully below, the resolution was actually much better on the 1982 photograph than what Tolleson believed it to be.

While Slagel is not a trained photogrammetrist or a licensed surveyor, Slagel has worked for the Department for approximately twelve years and has extensive experience in reviewing and interpreting aerial imagery specific to the coastline as does Boynton. Slagel currently serves as the Department's team lead for critical area and beachfront permitting and has taken GIS and remote sensing course work and uses them regularly along with historical aerial photographs and satellite imagery. As noted above, he has frequently digitized both vegetation line data and wet/dry shoreline data from imagery and has participated in updating the baselines and setback lines in both the 2009 and 2017 cycles. Unlike Tolleson, Slagel and Boynton (neither of whom were offered as expert witnesses in any discipline) are accustomed to regularly identifying coastal land features such as escarpments and vegetation from both modern and historical photography.

To verify the 1988 vegetation line digitized by the Department was the proper location for the baseline, the Department compared it to 1988 beach profile data to determine if the latter supported the position of the vegetation line in 1988. Beach profile data is a survey of the features of a beach and adjacent regions. The surveys here were conducted along multiple shore perpendicular transects that initiated at the ocean and extended landward into the dunes. The first substantial peak in a profile represents the most seaward dune feature,⁴¹ and that dune feature is

one challenged Boynton's testimony that the 1982 photograph also indicated a "very clear line of stable natural vegetation."

³⁹ Tolleson is a licensed professional engineer and licensed GIS surveyor. He is also admitted as a diplomate in the Academy of Geo-Professionals. Tolleson was qualified as an expert in civil engineering, professional GIS surveying, and remote sensing.

⁴⁰ Jones testified that in many cases, but not always, the vegetation line and the escarpment line coincide.

⁴¹ The seaward side of the dune feature is typically the most landward point of erosion.

typically vegetated.⁴² Here, the Department's 1988 vegetation line was in approximately the same position as the seaward dune feature. The Department performed a similar comparison for the 2006 and 2015 vegetation lines with the beach profile information for those years further confirming the Department had correctly placed the 1988 vegetation line.

As additional verification the Department's vegetation line was digitized in the correct location, the Department submitted evidence showing that Thomas & Hutton, an engineering firm retained by Petitioner, independently digitized the 1988 vegetation line in nearly the same location. Pantlik, Petitioner's Director of Development who has a degree in civil engineering, conceded this point.⁴³

Using historical vegetation lines, the evidence indicates and the Court finds the most landward shoreline in the last forty years to be the 1988 shoreline (reviewed) as evidenced by a continuous line of stable natural vegetation, and as depicted in Respondent's Exhibit 18. The Court finds the 1982 vegetation and escarpment lines⁴⁴ correspond with the 1988 vegetation line. The Department's evidence was both comprehensive and persuasive and the correct placement of the line was alternatively verified by the Department.

As will be discussed more fully below in the Court's alternative analysis, Petitioner's post-Hurricane Matthew shoreline or one reasonably approximate to it, specifically a 2017 post-Irma escarpment line (along with what Petitioner contends is a line of stable natural vegetation) could not possibly be the most landward shoreline in the last forty years as the Department identified four other vegetation shorelines (1982, 1988, 1993, and 1998) that were more landward than Petitioner's line.

Petitioner's Additional Arguments are Without Merit

Petitioner maintained the Department incorrectly determined the 1988 (reviewed) baseline by using the 1988 vegetation line because the vegetation line, which should act as a proxy, is the

⁴² This is supported by Hodge's testimony. When describing the beach profile at the Spit, Hodge stated, "of course the sand dunes have vegetation on them."

⁴³ At Pantlik's request, Thomas & Hutton sent Pantlik an aerial image with a digitization of a 1988 vegetation line that Thomas & Hutton had digitized. The image also showed the Department's digitization of the 1988 vegetation and setback line. Thomas & Hutton's independent digitization of the 1988 vegetation line was very close to what the Department had digitized as its 1988 vegetation line. In response, Pantlik asked Thomas & Hutton to digitize its 1988 vegetation line in a much more seaward location. In fact, Pantlik provided a hand-drawn line in the approximate position of where he wanted the vegetation line to be drawn. Thomas & Hutton complied but in its reply to Pantlik, acknowledged that it had digitized Pantlik's "interpretation" of the 1988 vegetation line.

⁴⁴ Even if there is no visible escarpment line, there is still a vegetation line that is evident. A vegetation line is a proxy for the shoreline.

leading edge of vegetation. Hodge's interpretation of the 1988 aerial photograph was submitted on remand and his vegetation line was much more seaward than the 1988 vegetation line digitized by the Department⁴⁵ and shown on Joint Exhibits 13 and 14. Hodge maintained the gray area seaward of the Department's 1988 aerial photo and where he placed his 1988 line, was a vegetated dune field,⁴⁶ as did Tolleson.

Hodge and Tolleson engaged in an analysis "to determine whether or not there was living vegetation, stable vegetation, seaward of the line that OCRM marked as the vegetation line" on the 1988 photograph. Hodge testified the photograph contained significant visual indications that there was a stable living vegetation line seaward of the line selected by the Department. Tolleson also testified that the gray area contained widespread "smudges" seaward of the vegetation line designated by the Department which was living heavy vegetation. He further testified the 1988 photograph had a multitude of shortcomings,⁴⁷ although this is the same photograph upon which he relied to support his stance that the Department's positioning of the vegetation line on that photograph was incorrect.

Tolleson then tried to improve what he stated was the 1988 photograph's usability. Specifically, Tolleson applied algorithms and mathematical filters⁴⁸ to identify more detailed content both seaward and landward of the Department's 1988 vegetation line. Tolleson thereafter concluded the shades of gray depicted on the photograph between the Department's unreviewed 1988 vegetation line and Petitioner's alternative 1988 vegetation line were the result of "digital signature in a black-white domain or spectrum indicative of not barren earth, and more consistent than not with vegetation."

Slagel disagreed and testified the gray area was devoid of a stable line of vegetation and only contained individual clumps of vegetation here and there. As to the southwestern end of the Spit, Slagel testified and the Court agrees that "it seemed odd that there would be a right angle in [Petitioner's] alleged vegetation line, as opposed to a more shore parallel type feature following a

⁴⁵ Petitioner's proposed 1988 vegetation line also was located much more seaward than a line digitized by Thomas & Hutton engineering firm as discussed herein.

⁴⁶ Hodge referred to it as a "five o'clock shadow."

⁴⁷ As to the 1988 photograph's quality, Tolleson called it "unquality" or "unqualified." He said the photo had scaling and precision issues, was grainy (pixelated or marginal), and had an unacceptable level of spatial precision or accuracy. He then continued to state the photograph was "probably suitable for some feature classifications but not positional" and proceeded to say "heavy vegetation can certainly be delineated here" by casual examination and without technical assistance.

⁴⁸ The Court notes in addition to expertise, the choice of filters to be applied to a photograph involves a degree of discretion and subjectivity.

line of continuous stable vegetation.” In fact, during the hearing, Hodge criticized the Department’s plotting of some of the lines stating they were not sufficiently wavy, yet Petitioner’s line at the southwest end of the Spit closely resembled a near perfect ninety-degree angle.

Finally, Slagel noted the existence of tire tracks well landward of Petitioner’s proposed 1988 vegetation line. Slagel said the parallel linear features were located on wet sand and curved up toward the dunes. Slagel explained this was an additional reason Petitioner’s digitization was not supported by the 1988 historical aerial photograph. Slagel posited that vehicles would have difficulty driving through vegetated dune fields and also, it would not be feasible without severely damaging the vegetation. In rebuttal, Hodge noted it was unknown when the tracks were initially made, and that tracks made across the dunes “will leave a signature for a long time.” Hodge testified that tracks on an active beach⁴⁹ will be covered by blowing sand within a few days, and that tides occurring around full or new moons “will occasionally wash out – well, they will wash away the tracks” on a monthly cycle.

Jones reviewed both Petitioner’s alternative 1988 line and the Department’s 1988 vegetation line. Like Slagel, Jones concluded there was not a line of stable vegetation seaward of the Department’s 1988 line. Jones testified Petitioner’s proposed line gave “too much credit for occasional clumps or plants with expanses of bare sand and active beach in between.” Jones went a step further and said Petitioner’s proposed 1988 vegetation line was on the active beach and was not one that should be used for regulatory purposes. The Court concurs with Jones.

With regard to Tolleson’s manipulation of the 1988 photograph, Jones who does not hold the same expert certifications as Tolleson but is a consumer of remote sensing information and routinely looks at different models (e.g., storm surge, wave, erosion, hurricane loss), testified he would call Tolleson’s “fuzzy filter” methodology “experimental.”⁵⁰ By experimental, Jones was referring to the fact that Tolleson’s validation was based on 2017 and 2020 information which merely lined up with Hodge’s 2017 post-Irma line. There was no validation of a vegetation line outside of Petitioner’s own results: no ground truth, no field survey. As such, Jones would not have relied upon it for the determination of a vegetation line unless he had additional validation.

⁴⁹ “Active beach” is defined by subsection 48-39-270(13) as “that area seaward of the escarpment or the first line of stable natural vegetation, whichever first occurs, measured from the ocean.”

⁵⁰ When looking at models, Jones looks to see if the model has been validated.

Jones testified some methods such as the ones employed by Tolleson may be precise but not accurate:

[W]e may be able to repeat our result and have our results close together if we do the same analysis several times, but that doesn't mean that we're hitting the target. We could be missing the target in the same place every time. Accuracy is how well we hit the target.

This Court finds Petitioner's evidence that a stable natural line of vegetation exists seaward of the Department's reviewed 1988 vegetation line is unconvincing. While vegetation may exist seaward of the Department's 1988 vegetation line, Petitioner failed to establish by a preponderance of the evidence that it is a line of stable natural vegetation. Instead, it is occasional and sparse. These sporadic clumps of vegetation should not be utilized for regulatory purposes in establishing a baseline.

The Imagery Used by the Department was Reliable and Accurate for Both Visual Analysis and Measurement

- 1982 Aerial Image

Petitioner initially objected to the 1982 image on the basis the Department did not review the image when it originally set the baseline and setback lines for the Spit during the most recent cycle. A contested case hearing is de novo, however, and as such, the parties can present new evidence.

While both Boynton and Slagel testified the 1982 image had quite good resolution and was of high quality, Tolleson disagreed and testified the scale and vertical resolution were lacking. Tolleson stated the color infrared image had been produced by the National Aerial Photography Program (NAPP) and that images produced by NAPP are good, cartographic quality and are flown at 20,000 feet so the scale on the image is "one on 40,000." He continued, "one on 40,000, which translates that one inch on the image would equate to about 3,400 linear feet on an image. So you're covering an awful lot of territory with a very small acetate map." Tolleson testified that because the "vertical resolution on an image like that is actually absent," it is impossible to detect an escarpment with the naked eye from the 1982 photograph.

Testimony was elicited during Tolleson's cross-examination which established his testimony related to the imagery source, scale, and vertical resolution was incorrect. Rather than being flown at 20,000 feet as Tolleson attested, data attributes for the 1982 image indicate it was flown at a substantially lower height of 6,004 feet giving it better resolution. Slagel testified the

description of the image by the United States Geological Survey (USGS) was that of “a high quality vertical cartographic photo with zero cloud cover.” He also georeferenced the image by tying it to a 2019 NAIP image, also a federal product. During his testimony, Tolleson misidentified this imagery as a NAPP aerial image when it was produced by a different agency. The image was taken by the National Park Service and was hosted by the USGS.

The Court is persuaded by Boynton and Slagel’s testimony that the 1982 image is of high quality in resolution, scale, and quality.

- 1988 Imagery

Petitioner objected to the Department’s use of a 1988 black and white digital photograph. Tolleson, who was qualified as an expert in civil engineering, professional GIS surveying, and remote sensing, testified the 1988 image was not quantitatively accurate. In particular, Tolleson stated that it was offset and areas of the images did not line up. He further testified the horizontal accuracy was inconsistent across the entire 1988 image such that one could not interpret and then develop measurements or points from the image. Specifically, Tolleson testified the image was flown at 20,000 feet and would have produced a scale of one inch to 40,000 inches which would not meet the “horizontal trueness” used by the surveying community.

The Department entered information into evidence indicating the scale was one inch to one-hundred feet, and introduced evidence the 1988 aerial imagery was certified by Benatec Associates as having been georectified to remove distortions to make it positionally accurate and usable for mapping purposes. Ground control was also used to ensure additional horizontal (positional) accuracy for the image so that it could be used for measurements.

In response to the remainder of Tolleson’s testimony regarding the 1988 photograph, Boynton testified there was no offset or shift. While it may have looked like a shift in certain areas, what was being seen was a bit of variability in the coloring and shading of the imagery, and in another place, reflectance from the water. To illustrate her point, Boynton indicated on the image how certain features like the marsh island or shoal area at the mouth of the Kiawah River actually matched. Boynton also pointed out the continuity of both the marsh and the coastline in the image. She further explained the image was provided in tile format and after reviewing them with the right image overlapping the left and then the left overlapping the right, things lined up.

In May 1990, Jones along with his then employer, Coastal Science & Engineering, Inc., prepared a report on behalf of Kiawah Resort Associates captioned, “Calculation of South Carolina

Coastal Council Jurisdictional Baselines and Setback Lines Kiawah Island.” That 1990 report documented Coastal Science & Engineering, Inc.’s methodology in determining where the lines should be located on Kiawah including the Spit and stated, “aerial photographs from 1949, 1954, 1957, 1963, 1983 and 1988 were to determine erosion rates and the most landward shoreline.” Finally, regulation 30-21(D)(2)(a) also references the 1988 photography:

The most accurate and useful maps for determining monument locations are the Council's orthophoto maps which are rectified to a scale of 100 feet per inch. These photographic maps are based on aerial photographs flown in July of 1988. The orthophoto maps are essential to the Council's Permitting, Planning and Enforcement divisions.

At first glance, the Court believed the image to be offset. However, after reviewing the 1988 image in light of Tolleson, Boynton and Slagel’s testimony, the Court concludes the image is of high quality and suitable for mapping and measurements in accordance with subsection 48-39-280(A)(2).

- 1993 Imagery & 1998 Imagery

The Department introduced similar evidence establishing the reliability and accuracy of the 1993 and 1998 aerials used by the Department.

The 1993 aerial imagery is part of the South Carolina Coastal Council Beachfront Mapping Program. The image provides its identification as an orthophoto index map, and contains the scale, coordinate system, and the date of the product. The image has a scale of one inch equaling five-hundred feet and is in the South Carolina State Plane Coordinate System. Westinghouse Landmark GIS, Inc. was the source of the aerial photograph and orthophoto mapping, and affirmed that “[t]his map complies with South Carolina and National Map Accuracy Standards.”

Kucera International Inc. provided the 1998 aerial photography to the Department and confirmed the horizontal and vertical coordinate system that was used to georeference the photographs. The evidence showed the scale on the 1998 imagery to be that of one inch equating to five-hundred feet. The image was also triangulated to the control, scanned and rectified.

- 2019 Imagery

Boynton testified that the 2019 imagery, a federal product, was obtained from the National Agricultural Imagery Program (NAIP) which is a federal program operated by the United States Department of Agriculture (USDA). The program has been operational for a long time and

collecting data since the 1990's, and Boynton stated she has high confidence in the image's positional accuracy.

The Department presented compelling evidence to counter Petitioner's challenges. Although the technology for capturing aerial imagery has improved over time, the Court finds the 1982, 1988, 1993, 1998 and 2019 images, which were either georeferenced or orthorectified by GIS professionals, are reliable and accurate for both visual analysis and measurement, including mapping, in accordance with subsections 48-39-280(A) and (A)(2) which require the Department to utilize the best available scientific and historical data.

Establishment of a Baseline If the Shoreline is Not Unlikely to Return to Its former Position

Even if the shoreline is not unlikely to return to its former position and the baseline must be set at the most landward point of erosion in the last forty years (and even without any consideration as to shoreline change and other policy considerations), Petitioner's argument still fails.

Subsection 48-39-280(A)(2) provides that unless the shoreline is unlikely to return to its former position, the baseline for inlet erosions zones not stabilized by jetties, terminal groins, or other structures must be determined by the Department as the most landward point of erosion at any time during the past forty years.

Regulation 30-21(H)(2) further provides in part, "in Unstabilized Inlet Erosion Zones the baseline is simply the most landward position of the shoreline in the most recent 40 years. This is determined by the Coastal Council staff using representative aerial photography."

Petitioner argues subsection 48-39-280(A)(2) and regulation 30-21(H)(2) conflict in that the most landward point of erosion at any time during the past forty years is not the same as the most landward position of the shoreline in the most recent forty years. Petitioner maintains that even though a shoreline may be a point of erosion of beaches that are eroding over time, a shoreline is not an erosional marker. The Department contends the statute and regulation do not conflict and that the regulation is a "natural amplification" of the statute.

While the Legislature may not delegate its power to make laws, in enacting a law complete in itself, it may authorize an administrative agency or board "to fill up the details" by prescribing rules and regulations for the complete operation and enforcement of the law within its expressed general purpose. *Heyward v. South Carolina Tax Comm'n*, 240 S.C. 347, 126 S.E.2d 15 (1962). An administrative regulation has the force of law and is valid as long as it is reasonably related to

the purpose of the enabling legislation. *Goodman v. City of Columbia*, 218 S.C. 488, 458 S.E.2d 531 (1995); *Hunter & Walden Co. v. South Carolina State Licensing Bd. for Contractors*, 272 S.C. 211, 251 S.E.2d 186 (1978). A regulation, however, must fall when it alters or adds to a statute. *Society of Prof'l. Journalists v. Sexton*, 283 S.C. 563, 324 S.E.2d 313 (1984).

Here, the statute is clear, if the shoreline is not unlikely to return to its former position, the baseline shall be set at the most landward point of erosion. Rather than merely enhancing the statute by providing a methodology to establish the most landward point of erosion, regulation 30-21(H)(2) substitutes the statutory mandate of setting the baseline at the most landward point of erosion for the most landward shoreline. The Court agrees with Petitioner but only to the extent Petitioner maintains the “most landward point of erosion” is not synonymous with the “most landward shoreline.” Under the plain meaning rule, it is not the Court's place to change the meaning of a clear and unambiguous statute. *Hodges v. Rainey*, 341 S.C. 79, 533 S.E.2d 578 (2000).

However, even if the Court follows only the statute, the result is still the same. As will be discussed more fully below, a vegetation line is not only an appropriate proxy to be used to establish a shoreline, but also, the most landward point of erosion.

Petitioner maintains if a beach is accreting, the shoreline itself cannot be a point of erosion. Hodge testified there has to be some history that the vegetation and dunes are not moving seaward but are actually going in the reverse direction, and suggested an erosional event must have occurred. He further testified there must be a “geomorphic expression of erosion” which would be an escarpment line or a heavy mineral deposit such as that left after large storms. He said there must be “some indication that sand has been moved away from an area, usually resulting in a vertical feature, an escarpment.” For this reason, Petitioner rejected the Department's 1988 (reviewed) vegetation line as not being a point of erosion.

To determine the most landward point of erosion in the last forty years, Hodge examined aerial photographs including those provided by the Department, “looking for anything from a geological perspective that would tell me that there was erosion going on ... That would tell me that there would be ... some erosional event.” Hodge determined there was no evidence of an erosional event until Hurricane Matthew in 2016, followed by Irma in 2017 “taking the dunes back another 10 feet or so.” After an extended cross-examination, Hodge conceded that he never

checked to see if there were any erosional events that occurred during the years that were at odds with his opinions (the Department's vegetation lines for 1982, 1998, 1993, and 1998).⁵¹

On October 9, 2017, about one month after Irma occurred on September 11, 2017, Hodge conducted a site visit at the Spit. During that visit, Hodge identified geomorphic expressions of erosion including the presence of an escarpment line, mineral deposits at the toe of the escarpment, an area where some of the dunes had been pushed back, and the presence of dead vegetation. Hodge set small flags to mark the separation of the living and dead vegetation as well as the escarpments and dune overwash. He took photographs of the erosional signs and the flags, and then took a video of the beach with the use of a drone. John T. Byrnes, III of Southeastern Land Surveying, LLC, Petitioner's expert land surveyor, followed and surveyed the flagged points. Hodge thereafter placed the surveyed points on an orthorectified satellite photograph of the Spit also taken in 2017. Hodge's surveyed line matched the geomorphic expressions of erosion visible on a 2017 satellite photo. Based on this information, Hodge concluded the erosional features that he observed along the beach caused by Irma constituted the most landward point of erosion in the last forty years.

In support of Hodge's conclusion, Petitioner presented Tolleson's Normalized Difference Vegetation Index (NDVI) using 2017 imagery and vector extraction on the 2020 imagery. NDVI is a remote sensing index used to map vegetation and in particular, the density of that vegetation. These analyses, however, were not probative of the most landward point of erosion in the last forty years because they were only performed on recent imagery.

As noted above, much of Petitioner's testimony and other evidence focused on assessing and verifying the 2017 post-Irma line. The Department did not take issue that Irma was an erosional event and did not dispute the accuracy of Petitioner's 2017 post-Irma escarpment line. However, the Department disputed the post-Irma escarpment line was the most landward point of erosion at any time in the last forty years. It also disagreed there had to be a major erosional event such as a named hurricane to establish the most landward point of erosion as erosional events occur on an ongoing basis given the coastline is a highly dynamic area. The Court concurs.

Jones testified that while geomorphic expressions of erosion are desirable for determining the most landward point of erosion, they do not always exist because the Department's records are not complete. The Department does not have continuous and ongoing surveys going back in time

⁵¹ Hodge stated, "I didn't find anything specific that I could tie to a particular event."

including those that document escarpment lines as was done by Petitioner post-Irma. To that end, alternative means of identifying the most landward point of erosion are utilized. Jones testified:

If we don't have perfect historical information, we have occasional photos, we don't have photos every month, we don't have ground surveys going back in time, so we'd have to use something, and we use vegetation line from aerial photos.

He further stated if an escarpment is visible from a photograph, it is utilized. If not, the next best thing is used: a vegetation line. Jones testified a vegetation line will always be at or seaward of the previous escarpment line, and in many cases, they will coincide.

To require evidence of a geomorphic expression as Petitioner suggests would in effect, eliminate the forty-year look back period mandated by the legislature.

Utilization of vegetation lines discerned from aerial imagery in identifying the most landward point of erosion is consistent with the recommended methodology made by Coastal Science & Engineering, Inc. to the South Carolina Coastal Council in 1988. Jones further stated the Department continues to use that methodology of employing the vegetation lines to determine the most landward point of erosion.

Similarly, Boynton testified there is support in the scientific peer reviewed literature for a vegetation line serving as a biological indicator of or proxy for the most landward point of erosion. The term, "most landward point of erosion" is not defined by the Legislature and the statute does not set forth what feature(s) is to be used in making this determination. As such, the Department uses the definition of "active beach" and scientific literature to guide it resulting in the use of a stable natural line of vegetation as a proxy. Boynton explained the Department is not saying that at the vegetation line, erosion is occurring, but rather that "erosive inundation actions are sufficient on this side of the line [referring to the seaward side of the vegetation line] to prevent that vegetation from forming, and on this side [referring to the landward side of the vegetation line] the vegetation is able to form and become stable and dense and all of that." Simply put, the Department is stating that there are sufficient erosional forces and inundation seaward of the line of stable natural vegetation to prevent that line from moving forward. The line of stable natural vegetation will always be above the active beach where it is not subjected to the ebb and flow of saltwater.

The Court acknowledges the most landward vegetation line in the last forty years is not synonymous with the most landward point of erosion in the last forty years. However, when an escarpment line or other geographical sign of erosion is not visible on a photograph or otherwise

available, a line of stable natural vegetation is a sound and appropriate proxy for the most landward point of erosion. This is particularly the case whereas here, there is an absence of continuous and ongoing survey information for the last forty years. A vegetation line will always be at or seaward of the last escarpment which is actually more favorable to the property owner. Jones testified in the absence of other physical data, the Department's methodology in utilizing the vegetation line as a proxy for the most landward point of erosion is scientifically acceptable and sound, and is consistent with the Beachfront Management Act, and the procedure used dating back to the South Carolina Coastal Council, the Office of Coastal Resource Management's predecessor.

It is not lost on the Court that using a line of stable natural vegetation as a proxy or indicator for both the most landward point of erosion (in the absence of historical discernable evidence of erosion such as an escarpment line) and the most landward position of the shoreline makes the two essentially indistinguishable. To go a step further, one could argue that because a vegetation line may be used as a proxy for the most landward position of the shoreline, a shoreline may then also be used as a proxy for the most landward point of erosion.⁵² This is somewhat circuitous and would also render any conflict between subsection 48-39-280(A)(2) and regulation 30-21(H) meaningless.

Nevertheless, the Court finds a line of stable natural vegetation is a scientifically sound and accepted proxy or marker for the most landward point of erosion. Employing this methodology of utilizing historical lines of stable natural vegetation as proxies or indicators of the most landward point of erosion and for the same reasons discussed above, the Court rejects Petitioner's alternative 1988 vegetation line⁵³ and finds the Department properly determined the 1988 vegetation line as reviewed and revised on remand, to be the most landward point of erosion in the last forty years.

As to Petitioner's 2017 post-Irma escarpment line which Petitioner posited was the most landward point of erosion in the last forty years, Jones testified the line was merely an escarpment line after Irma. When the Department plotted the location of Petitioner's 2017 post-Irma line on the 1988 orthoimagery, Petitioner's line appeared below the high-tide mark and in the water, which is below (seaward of) the active beach. Hodge admitted the most landward point of erosion would

⁵² In fact, Boynton testified at the hearing that the most landward position of the shoreline could be an indicator for the most landward point of erosion.

⁵³ Once again, Petitioner's alternative 1988 vegetation line gave too much credit for occasional clumps or plants with expanses of bare sand. As noted by Jones, for the most part, Petitioner's alternative 1988 vegetation line is on the active beach and should not be used for regulatory purposes. Petitioner's alternative 1988 line was seaward of both the Department's 1988 and the Thomas & Hutton's 1988 vegetation lines.

be landward of the active beach. Utilizing the 1988 aerial image with Petitioner's post-Irma line superimposed upon it, Jones explained it was obvious there was more landward erosion in the forty-year window. Jones explained, "it is physically impossible for a most landward point of erosion to be on the active beach."

The Court finds Petitioner's 2017 post-Irma line is not the most landward point of erosion in the last forty years, but merely an escarpment line present after Irma in 2017.⁵⁴ Support for this conclusion lies in the Department's digitization of Petitioner's 2017 post-Irma line on the 1988 photograph. The overlay indicates Petitioner's line was in the intertidal zone based upon where the shoreline existed in 1988. As depicted on the 1988 photograph, Petitioner's 2017 post-Irma escarpment line is in the water below the high tide mark.

Moreover, the Department presented credible evidence the 1982, 1988, 1993, and 1998 aerial photographs demonstrate stable natural vegetation lines that are landward of Petitioner's 2017 post-Irma escarpment line. Petitioner's 2017 post-Irma escarpment line could not possibly be the most landward point of erosion in the last forty years. It matters not that the ocean front of the Spit is accreting.

Establishment of a Setback Line

To implement the beach preservation policy provided in subsection 48-39-280(A), subsection 48-39-280(B) mandates a setback line to be established landward of the baseline a distance which is forty times the average annual erosion rate or not less than twenty feet from each erosion zone based upon the best historical and scientific data adopted by the Department as a part of the State Comprehensive Beach Management Plan.

Here, the parties agree and the Court finds the setback line shall be established twenty feet landward of the baseline which is in compliance with subsection 48-39-280(B).⁵⁵

⁵⁴ As an aside, the Court has reviewed Petitioner's photographs and aerial drone footage. The Court notes the vegetation depicted therein at or near Petitioner's 2017 post-Irma lines appears to the Court to be scant and occasional.

⁵⁵ The Department, and specifically Boynton, performed an oceanside shoreline change analysis using a tool called AMBUR which is the acronym for Analyzing Moving Boundaries Using R. "R" is a statistical program. AMBUR analyzes wet/dry shorelines and produces annual shoreline change rates. The tool drew a line every 200 feet across the shorelines and then captured the intersection points between the lines and wet/dry shorelines. The software program analyzed the intersection points and produced a rate of change. The average annual shoreline change rate was then multiplied by forty to generate the distance from the baseline. The distance establishes the setback line. Here, however, the parties agreed upon the placement of the setback line.

CONCLUSIONS OF LAW

General

Jurisdiction

This Court has subject matter jurisdiction in this case pursuant to subsection 1-23-600(A) and subsection 48-39-280(E). S.C. Code Ann. § 1-23-600(A) (Supp. 2021); S.C. Code Ann. § 48-39-280 (Supp. 2017).⁵⁶

Petitioner timely filed its request for a contested case hearing on November 20, 2017, and prior to the deadline of January 1, 2018. *See* S.C. Code Ann. § 48-39-280(A)(4)(c) and (B) (Supp. 2021).

Legal Standards

This is a contested case, and pursuant to the Administrative Procedures Act, this Court is the fact finder in this case and conducts its review de novo. *Brown v. S.C. Dep't of Health & Envtl. Control*, 348 S.C. 507, 512, 560 S.E.2d 410, 413 (2002); *Hill v. S.C. Dep't of Health & Envtl. Control*, 389 S.C. 1, 9, 698 S.E.2d 612, 616 (2010). “The burden is on appellants to prove convincingly that the agency’s decision is unsupported by the evidence.” *Waters v. S.C. Land Res. Conservation Comm’n*, 321 S.C. 219, 226, 467 S.E.2d 913, 917 (1996)). Petitioner has the burden of proving the agency was in error under the statutory and regulatory standards. *Leventis v. Dep’t of Health and Envtl. Control*, 340 S.C. 118, 530 S.E.2d 643 (Ct. App. 2000). The standard of proof in a contested case before the Administrative Law Court is by the preponderance of the evidence. S.C. Code Ann. § 1-23-600(A)(5) (Supp. 2021); *Sierra Club v. S.C. Dep't of Health & Envtl. Control*, 426 S.C. 236, 258, 826 S.E.2d 595, 607 (2019).

Even when this Court considers a case “in the posture of an appeal, the ALC [does not sit] in an appellate capacity and [is] not restricted to a review of [the Agency’s] permit decision.” *Brown v. S.C. Dep’t of Health & Envtl. Control*, 348 S.C. 507, 512, 560 S.E.2d 410, 413 (2002) (citing *Reliance Ins. Co. v. Smith*, 327 S.C. 528, 489 S.E.2d 674 (Ct.App.1997)). “Instead, the proceeding before the ALJ [is] in the nature of a de novo hearing with the presentation of evidence and testimony.” *Id.*

The weight and credibility assigned to evidence presented at a hearing is within the province of the trier of fact. *S.C. Cable Television Ass'n v. S. Bell Tel. & Tel. Co.*, 308 S.C. 216.

⁵⁶ This section was amended in 2018 and the jurisdictional section was modified and moved from subsection 48-39-280(E) to (F).

222, 417, S.E.2d 586, 589 (1992). “It is generally recognized that the trier of fact, who has the opportunity to observe the witnesses and listen to their testimony in person, is in the best position to determine the issues of witness credibility.” *Dixon v. Dixon*, 336 S.C. 260, 263, 519 S.E.2d 357, 358 (Ct. App. 1999).

Under Rule 702 of the South Carolina Rules of Evidence, “[i]f scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.” Rule 702, SCRE. An expert is granted wide latitude in determining the basis of his opinion, and where an expert's testimony is based upon facts sufficient to form an opinion, the trier of fact must weigh its probative value. *Small v. Pioneer Mach., Inc.*, 329 S.C. 448, 470, 494 S.E.2d 835, 846 (Ct. App. 1997).

Additionally, “[t]he qualification of a witness as an expert in a particular field is within the sound discretion of the trial judge.” *Smoak v. Liebherr-America Inc.*, 281 S.C. 420, 422, 315 S.E.2d 116, 118 (1984). Where the expert’s testimony is based upon facts sufficient to form the basis for an opinion, the trier of fact determines its probative weight. *Berkeley Elec. Coop. v. S.C. Pub. Service Comm’n*, 304 S.C. 15, 402 S.E.2d 674 (1991). Furthermore, the trier of fact is not compelled to accept an expert’s testimony, but he may give it the weight and credibility he determines it deserves. *Florence Cnty. Dep’t of Social Servs. v. Ward*, 310 S.C. 69, 425 S.E.2d 61 (Ct. App.1992). The trier of fact may accept one expert’s testimony over that of another. *S.C. Cable Television Ass’n v. S. Bell Tel. & Tel. Co.*, 308 S. C. 216, 417 S.E.2d 586 (1992).

The Administrative Procedure Act specifically provides that “[t]he agency's experience, technical competence and specialized knowledge may be utilized in the evaluation of evidence” pursuant to section 1-23-330 and subsection 44-1-60(F)(2). S.C. Code Ann. § 1-23-330 (2005); S.C. Code Ann. § 44-1-60(F)(2) (2018). Also, the Supreme Court held that “[w]e defer to an agency interpretation unless it is ‘arbitrary, capricious or manifestly contrary to the statute.’” *Kiawah*, 766 S.E.2d at 718 (quoting *Chevron*, 467 U.S. at 844).

Applicable Baseline and Setback Line Statutes

The Act’s Policy of Beach Preservation

In July 1988, the South Carolina legislature enacted the South Carolina Beachfront Management Act. The Act established a comprehensive statewide beachfront management

program. The legislature has established a policy of beach preservation. S.C. Code Ann. § 48-39-280(A) (Supp. 2021). The applicable portions of section 48-39-280, state:

(A) A policy of beach preservation is established. The department must implement this policy and utilize the best available scientific and historical data in the implementation. The department must establish a baseline that parallels the shoreline for each standard erosion zone and each inlet erosion zone.

...

(2) The baseline for inlet erosion zones that are not stabilized by jetties, terminal groins, or other structures must be determined by the department as the most landward point of erosion at any time during the past forty years, unless the best available scientific and historical data of the inlet and adjacent beaches indicate that the shoreline is unlikely to return to its former position. In collecting and utilizing the best scientific and historical data available for the implementation of the beach preservation policy, the department, as part of the State Comprehensive Beach Management Plan provided for in this chapter, among other factors, must consider historical inlet migration, inlet stability, channel and ebb tidal delta changes, the effects of sediment bypassing on shorelines adjacent to the inlets, and the effects of nearby beach restoration projects on inlet sediment budgets.

...

(B) To implement the beach preservation policy provided for in subsection (A), a setback line must be established landward of the baseline a distance which is forty times the average annual erosion rate or not less than twenty feet from the baseline for each erosion zone based upon the best historical and scientific data adopted by the department as a part of the State Comprehensive Beach Management Plan.

...

(E)(1) In order to locate the baselines and the setback lines, the department must establish monumented and controlled survey points in each county fronting the Atlantic Ocean. The department must acquire sufficient surveyed topographical information on which to locate the baselines.

Baseline and setback lines must be revised not less than every seven years but not more than every ten years after each preceding establishment cycle. S.C. Code Ann. § 48-39-280(C) (Supp. 2021). After the most recent cycle in 2017, the baseline cannot be moved seaward. S.C. Code Ann. § 48-39-280(A)(4)(c) (Supp. 2021).

Establishment of the Baseline

Whether the Shoreline is Unlikely to Return to Its Former Position

In order to determine the test to be utilized in establishing the baseline, it must first be decided whether the shoreline is unlikely to return to its former position.

The Court finds both Petitioner and the Department provided testimony and other evidence as to whether the shoreline was unlikely to return to its former position even though both parties represented to the Court the issue was not in controversy.⁵⁷

Here, the best available scientific and historical data relating to the inlet and adjacent beaches indicate by a preponderance of the evidence that the shoreline is unlikely to return to its former position as evidenced by an analysis of the factors set forth in subsection 48-39-280(A)(2). Specifically, the Court concludes the shoreline is unlikely to return to its former position based upon the overall decrease in the dune field at the neck; the Spit's vulnerability to a breach at the neck; the migration and movement of the Spit; and the fact that there is no certainty Inlet relocation projects will continue into the future. The Department erred in determining the shoreline was not unlikely to return to its former position.

The Most Landward Position of the Shoreline in Forty Years

Section 48-39-280 does not set forth the test to be utilized in establishing the baseline in an unstabilized inlet erosion such as the Spit, when the shoreline is unlikely to return to its former position. Petitioner concurs. Regulation 30-21(H)(2) does, however, set forth such a test:

H. Methodology and the Generation and Adoption of Baselines and Setback Lines

...

(2) In Standard Erosion Zones, the baseline is the crest line of the primary dune. If there is no natural primary dune then its location can be determined based on existing natural dunes in the area. Natural dunes are surveyed at Coastal Council monitoring stations. An average or "ideal" dune is calculated and superimposed on beaches without natural dunes. Baselines are determined the same way in Stabilized Inlet Erosion Zones. *However, in Unstabilized Inlet Erosion Zones the baseline is simply the most landward position of the shoreline in the most recent 40 years. This is determined by the Coastal Council staff using representative aerial photography.*

S.C. Code Ann. Regs. 30-21(H) (2011) (emphasis added). Regulation 30-21(H) which was originally enacted in 1993, expressly mandates the Department to locate the baseline using the most landward position of the shoreline in the last forty years using representative aerial photography. *Id.*

⁵⁷ The Department's position is the shoreline is not unlikely to return to its former position. Petitioner initially disputed this but withdrew its contest on this matter on the eve of the hearing. Petitioner (as well as the Department) did, however, present evidence as to whether the shoreline was unlikely to return its former position including evidence pertaining to the Spit's accretion, erosion, and movement over time, and inlet relocation projects. As to issues before it, the Court may find facts in its own view of the preponderance of the evidence.

In the absence of ongoing survey information, vegetation lines are reasonable and appropriate proxies for the shoreline. The use of a vegetation shoreline is consistent with peer-reviewed, scientific literature related to shoreline proxies. Also, since the implementation of the Act, the Department has continuously utilized vegetation lines as proxies for the shoreline.

The vegetation line used to set the baseline must be one that is stable and natural, rather than one that contains only sporadic clumps of vegetation. The vegetation portrayed in Petitioner's photographs and drone video footage at or near the post-Hurricane Matthew shoreline or one reasonably approximate to it, specifically a 2017 post-Irma escarpment line, consists only of isolated clumps.

A review of the evidence including historic lines of stable natural vegetation indicates the most landward vegetation shoreline in the last forty years is the 1988 line as reviewed and revised by the Department upon remand. Beach profile data supports this conclusion and the baseline should be set at this line. The Department arrived at this same conclusion using a different test (the most landward point of erosion in the last forty years).

The placement of the baseline in this location is consistent with the General Assembly's expressed policy of beach preservation set forth in subsection 48-39-280(A).

The Most Landward Point of Erosion in Forty Years

Even if the shoreline is not unlikely to return its former position, the result is the same. Thus, the Department arrived at the correct placement of the baseline.

Section 48-39-280(A)(2) provides if the shoreline is not unlikely to return to its former position, the test for baseline placement is the most landward point of erosion in the last forty years. Regulation 30-21(H)(2) further provides in part, "in Unstabilized Inlet Erosion Zones the baseline is simply the most landward position of the shoreline in the most recent 40 years. This is determined by the Coastal Council staff using representative aerial photography." Petitioner maintains the statute and regulation conflict. The Department submits the regulation is a natural amplification of the statute and that its interpretation should be given deference.

Administrative agencies are given broad discretion to promulgate rules and regulations as to the enforcement of law. *Fisher v. J. H. Sheridan Co.*, 182 S.C. 316, 189 S.E.2d 356 (1936). Here, the Department has been given expansive authority to implement, administer and enforce the General Assembly's policy of protection of the quality of the coastal environment including beach preservation. *See e.g.*, S.C. Code Ann. § 48-39-50 (2008 and Supp. 2021) (powers and

duties of the Department); S.C. Code Ann. § 48-39-80 (Department to develop a comprehensive coastal management program); S.C. Code Ann. § 48-39-120 (2008) (Department to develop and institute comprehensive beach erosion control policy); S.C. Code Ann. § 48-39-210 (2008) (Department only agency authorized to permit or deny alterations/utilizations within critical areas); and S.C. Code Ann. § 48-39-280 (Supp. 2021) (beach preservation policy established and the Department’s responsibilities for establishment of baselines and setback line).

Courts generally defer to an administrative agency’s interpretation of an applicable statute or its own regulation. *Sierra Club v. S.C. Dep’t of Health and Env’tl. Control*, 426 S.C. 236, 256, 826 S.E.2d 595, 607 (2019) (citing *Brown v. Bi-Lo*, 354 S.C. 436, 440, 581 S.E.2d 836, 838 (2003)). “If the statute or regulation is silent or ambiguous with respect to a specific issue, a court must give deference to the agency’s interpretation of the statute or regulation, assuming the interpretation is worthy of deference.” *Sierra Club*, 426 S.C. at 256, 826 S.E.2d at 606 (citing *Kiawah Dev. Partners, II v. S.C. Dep’t of Health & Env’tl. Control*, 411 S.C. 16, 33, 766 S.E.2d 707, 717 (2014) (internal quotation marks and citations omitted)). “Nevertheless, where ... the plain language of the statute [or regulation] is contrary to the agency’s interpretation, the Court will reject the agency’s interpretation.” *Brown*, 354 S.C. at 440, 581 S.E.2d at 838

Here, subsection 48-39-280(A)(1) specifically and unambiguously addresses placement of the baseline in instances of an unstabilized inlet erosion zone when the shoreline is not unlikely to return to its former position. While the Department’s interpretation of the regulation being an amplification of the statute is entitled to the most respectful consideration, it must be rejected whereas here, there is an unreconcilable conflict. *Kiawah Dev. Partners, II, supra* (citing *Chevron, U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837, 844, 104 S.Ct. 2778, 2782, 81 L.Ed.2d 694, ___ (1984) (The Court will defer to an agency’s interpretation unless it is “arbitrary, capricious or manifestly contrary to the statute.”). The statute unequivocally states in an unstabilized inlet erosion zone, the baseline must be set “at the most landward point of erosion at any time during the past forty years.” While regulation 30-21(H)(2) purports to set forth a methodology to discern the most landward point of erosion, it actually substitutes the statutory mandate of setting the baseline at the most landward point of erosion for “the most landward position of the shoreline.” “[T]he most landward point of erosion” set forth in subsection 48-39-280(A)(2) is not equivalent to “the most landward position of the shoreline.” Regulation 30-21(H)(2) is not a natural amplification of subsection 48-39-280(A)(2) but instead, alters it. *See*

Society of Prof'l. Journalists, supra. As such, Subsection 48-39-280(A)(2) is controlling. Nevertheless, the outcome is the same and the conflict is not of any consequence under the facts of this case.

When an escarpment line or other geographical sign of erosion is not visible (including on a photograph) or otherwise available, a line of stable natural vegetation is a sound and appropriate proxy for the most landward point of erosion. This is particularly the case whereas here, there is an absence of continuous and ongoing survey information for the last forty years. Historical data and information are not always perfect and thus, the Department and this Court must use the best available scientific and historical information as required by statute.

A vegetation line will always be at or seaward of the last escarpment. In some instances, the vegetation line and escarpment line will coincide. Using vegetation lines as proxies including those identified from aerial photography for landward points of erosion is entirely consistent with the methodology outlined by Coastal Science & Engineering, Inc. for the South Carolina Coastal Council in 1988. While there have been some modifications over the years as technology has changed, the Department has essentially continued to use the same methodology. This methodology is also consistent with the statute.

Upon reviewing all of the vegetation lines, the Court finds the most landward one or point of erosion in the last forty years to be the Department's 1988 vegetation line as reviewed on remand. This 1988 vegetation line is in substantially the same location as a 1982 vegetation line and evidence of escarpment that appears in a 1982 photograph. Even if there is no discernable evidence of escarpment at that location, the 1988 line of stable natural vegetation is sufficient in and of itself for purposes of determining the most landward point of erosion in the last forty years. Other independent validating evidence supports the conclusion the Department's 1988 vegetation line as reviewed and revised on remand is proper for baseline placement, including an engineering firm's response to Petitioner's request for the digitization of the 1988 vegetation line. Also, beach profile data supports it.

Petitioner has failed to meet its burden of demonstrating the Department erred in its methodology of determining the most landward point of erosion, or in the Department's conclusion as to the most landward point. Petitioner's alternative 1988 vegetation line is much more seaward than the Department's 1988 vegetation line and Petitioner's line does not represent a stable continuous line of natural vegetation but rather, one that is sparse.

Monument Survey Data was Properly Utilized in Establishing the Baseline

Subsection 48-39-280(E)(1) provides in part, “In order to locate the baselines and the setback lines, the department must establish monumented and controlled survey points in each county fronting the Atlantic Ocean.” Subsection 48-39-280(E)(2) continues in part by stating the data surveys from these stations must locate the crest of the primary oceanfront sand dune to be used as the baseline for computing the forty-year erosion rate.” Regulation 30-21(B)(7)(a)(i) further provides that to improve the data base of coastal processes, “A monitoring program must be developed to periodically survey beach profiles along the coast. Each station will be surveyed at least twice each year.”

To that end, the Department has established thirty-five survey points at Kiawah including the Spit. Monument 2620 is slightly to the southwest of the neck of the Spit, and Monument 2625 is to the northeast of the neck on the far side of Beachwalker park.

Here, the Department collected and published beach survey information from each station. These stations were accurately represented on orthophotographs. Historically, the information was collated in a surveyor’s packet so that surveyors were able to use the coordinates (including northing, easting, and elevation) to flag a baseline or a setback line on a property. The packets included the actual coordinates in digital form; an excel spreadsheet which sets forth the coordinates in state plane of northing, easting, and elevation; a Computer-Aided Design (CAD) format of the coordinates; and information about the beach survey monuments. During this delineation cycle, the Department included some of this information in its line report for each beach, and then provided much of the information online.

In this case, that survey data was used by the Department and the Court for purposes of establishing the baseline in conjunction with aerial imagery. As an example, the Court utilized the data from the monuments in order to determine accretion and erosion rates, as well as to make a determination as to whether the shoreline was unlikely to return to its former position. In fact, Hodge and Jones also compiled this data to arrive at their opinions. Specifically, Petitioner used the survey monument data to support its position that the oceanside of the Spit is accreting.

The Court finds the Department complied with the statutory mandate in establishing monuments and controlled survey points for purposes of locating the baseline, and that data was used by the Department and this Court in establishing the baseline although it was not needed to

compute the forty-year erosion rate for the setting of the setback line (as mandated by regulation 30-21(B)) as the parties agreed to the placement of the setback line.

Aerial Imagery Was Properly Used in Establishing the Baseline, and the Imagery Was of Sufficient Quality for this Purpose

In addition to the use of monument data as required by subsection 48-39-280(E)(1), regulation 30-21(H) provides aerial photography is to be used in establishing the most landward position of the shoreline.⁵⁸ Subsection 48-39-280(E)(1) does not provide data from the monuments is to be the exclusive source of information used to locate the baselines.⁵⁹ Thus, subsection 48-39-280(E)(1) can be read in concert with regulation 30-21(H) which provides aerial photography is to be used in establishing the most landward position of the shoreline at least in the instance where the shoreline is unlikely to return to its former position. *Hodges v. Rainey*, 341 S.C. 79, 533 S.E.2d 578 (2000) (The goal of statutory construction is to harmonize conflicting statutes whenever possible and to prevent an interpretation that would lead to a result that is plainly absurd). In instances where the shoreline is not unlikely to return to its former position, the use of aerial imagery is also imperative in locating vegetation and escarpment lines in locating the most landward point of erosion given the absence of historical survey data.

Moreover, the monuments were only installed in 1987, one year prior to the enactment of the Beachfront Management Act in 1988 with the purpose of studying accretion and erosion along the State's beaches. S.C. Code Ann. Regs. 30-21(D)(1) (2011);⁶⁰ Joint Ex. 3, P. 3. Without the use of aerial imagery, the Department would be unable to establish the most landward position of the shoreline or the most landward point of erosion in the last forty years, and thus, the imagery was appropriately used under both analyses.

The aerial imagery used by the Department, and the Court in this case, to assist in establishing the baseline was both reliable and accurate for both visual analysis and measurement. The Department and the Court properly used data from the monument survey stations in

⁵⁸ As discussed herein, subsection 48-39-280(A)(2) does not set forth the methodology for setting the baseline when the shoreline is unlikely to return to its former position.

⁵⁹ Additionally, subsection 48-39-280(E)(3) provides the Department, by regulation, may exempt specifically described portions of the coastline from survey requirements. Regulation 30-21(D)(1) provides in part that "Except in areas designated as Unstabilized Inlet Zones under the amended Act, baselines and setback lines are formulated primarily on the basis of data collected at beach survey stations."

⁶⁰ "The South Carolina Coastal Council's Beach Monitoring Program was established in 1985. At that time, the purpose of the program was to study erosion and accretion along the state's beaches. The program was upgraded in 1987 in anticipation of the 1988 amendments to the South Carolina Coastal Zone Management Act, as amended."

conjunction with aerial imagery in establishing the baseline in this case. The Court notes Petitioner also used both.

The use of aerial imagery in this case comports with utilization of “the best scientific and historical data available” as directed by subsection 48-39-280(A)(2). Using aerial imagery to determine the most landward shoreline and the most landward point of erosion for purposes of setting the baseline is also consistent with Coastal Science and Engineering, LLC’s recommendations to the South Carolina Coastal Council as far back as 1988. This same methodology was used by Coastal Science and Engineering, LLC in a 1990 report it prepared for Kiawah Resort Associates, and is consistent with the methodology utilized by the Department in establishing baselines since the first jurisdictional lines were established.

Petitioner’s 2017 Post-Irma Escarpment Line Is Neither the Most Landward Shoreline nor the Most Landward Point of Erosion

Petitioner failed to meet its burden of proving its 2017 post-Irma escarpment/vegetation line, serves as the most landward shoreline or point of erosion in the last forty years. While it is one of the lines to be considered in determining the most landward shoreline and point of erosion in the last forty years, Petitioner’s 2017 post-Irma line is merely an escarpment line that was visible after Irma. When the 2017 line is plotted on 1988 orthoimagery, Petitioner’s line is in the intertidal zone and below the high tide mark based upon where the shoreline existed in 1988. It is impossible for a most landward point of erosion to be on the active beach.

Other than the proposition of an alternative 1988 vegetation line, Petitioner introduced no evidence of historical shorelines or vegetation lines. After considering Petitioner’s evidence (including photographs and drone imagery of the demarcated line), the Court finds Petitioner considered only recent imagery (the 2017 post-Irma vegetation and escarpment line) and not the full forty years as required by statute.

Geomorphic expressions of erosion are preferable in determining the most landward point of erosion however, they are not mandated by statute. If there absolutely had to be a geomorphic expression of erosion (such as that caused by an erosional event) as Petitioner contends in order to determine the most landward point of erosion, the forty-year look back period would be rendered meaningless given the lack of historical surveys now and also, when the Act was first enacted. *Florence Cnty. Democratic Party v. Florence Cnty. Republican Party*, 389 S.C. 124, 128, 727 S.E.2d 418, 420 (2021) (Statutory language must be construed in light of the intended purpose of

the statute. A court should seek a construction that gives effect to every word of a statute rather than adopting an interpretation that renders a portion meaningless).

Similarly, there is no requirement there be an erosional event. In the absence of ongoing historical information, employment of vegetation lines as proxies for both the most landward shoreline and the most landward point of erosion are appropriate and sound, and consistent with the Act. Utilizing lines of stable natural vegetation as proxies, there are four vegetation shorelines within the forty-year window that are more landward than Petitioner's 2017 post-Irma line: 1982, 1988, 1993, and 1998. The Department's evidence of escarpment (which is a geomorphic expression of erosion) and a stable vegetation line depicted in a 1982 photograph in the same vicinity as the 1988 vegetation line, provides further support there are shorelines and points of erosion more landward of Petitioner's 2017 post-Irma escarpment line.⁶¹ Regardless of which analysis is used (e.g., the shoreline is unlikely to return to its former position and setting the baseline at the most landward position of the shoreline, or the shoreline is not unlikely to return to its former position and setting the baseline at the most landward point of erosion), the outcome is the same.

Similarly, it matters not that the oceanfront of the Spit has a long-term trend of accretion and seaward movement. Despite the trend of accretion, there were still periods of erosion.⁶² While the net effect is one of accretion, for purposes of actual baseline placement, the legislature has made no specific provision for consideration of accretion although the shoreline change rate is used to establish the setback line. S.C. Code Ann. § 48-39-280(B) (Supp. 2021).⁶³ Accretion is also a factor to be considered in determining whether the shoreline is unlikely to return to its former position and thus, the legislature has already taken accretion into consideration.

ORDER

Based on the foregoing,

IT IS HEREBY ORDERED that the baseline shall be set at the position set forth by the Department in its final decision after remand;

⁶¹ In many cases, the vegetation line and the escarpment line coincide such as depicted in the 1982 photograph. Again, even if there was no evidence of escarpment in the 1982 photograph, the lines of stable natural vegetation are sufficient for purposes of determining the most landward point of erosion under the facts of this case.

⁶² Storms are a naturally occurring phenomena along the coastline and cannot be discounted.

⁶³ The Court notes accretion was also considered in determining whether the shoreline was unlikely to return to its former position which is authorized by subsection 48-39-280(A)(2). Thus, the legislature has already taken accretion into account.

IT IS FURTHER ORDERED that the setback line shall be set twenty feet landward of the baseline.

AND IT IS SO ORDERED.

A handwritten signature in cursive script that reads "Shirley C. Robinson". The signature is written in black ink and is positioned above a horizontal line.

SHIRLEY C. ROBINSON
Administrative Law Judge

June 24, 2022
Columbia, South Carolina

CERTIFICATE OF SERVICE

I, Ti'a Smith, hereby certify that I have this date served this Order upon all parties to this cause by depositing a copy hereof in the United States mail, postage paid, or by electronic mail, to the address provided by the party(ies) and/or their attorney(s).



Ti'a Smith
Judicial Law Clerk

June 24, 2022
Columbia, South Carolina

