SURFRIDER FOUNDATION
SAN DIEGO COUNTY

December 8, 2022

Delivered via email

To: Karl Schwing
District Director, San Diego Coast
California Coastal Commission

Re: Th16c - Application No 6-23-0342, Kate and AJ Pollock, 529 Pacific Avenue, Solana Beach

Honorable Commissioners,

The Surfrider Foundation is a nonprofit grassroots organization dedicated to the protection and enjoyment of our world's ocean, waves, and beaches through a powerful network. Thank you for the opportunity to comment on this project. We opposed this project in front of Solana Beach City Council in October 2021. The city's current trajectory of perpetuating blufftop development and rewarding reckless redevelopment by permitting seawalls has set us up for the inevitable loss of the public's beaches. This proposed project exemplifies these concerns. We respectfully disagree with staff's recommendation for approval of this permit, as the revised retreat rate as determined by the Commission's engineer appears to calculate the retreat rate in the presence of filled seacaves. However, per the Coastal Act and the city's certified LUP, retreat rates and therefore setbacks must be calculated without the stabilizing effect of coastal armoring.

Specifically, we have concerns with staff's recent revision of the retreat rate and therefore the Geologic Setback Line (GSL) for this site. In 2022, we concurred with the Commission staff's recommendation to deny the project application. This recommendation for denial was based on the Commission's geologist's determination that the GSL should be located 86-89 ft from the bluff edge[1]. We were disturbed to see the retreat rate change so significantly from the 2022 staff report recommending denial to the 2023 staff report now recommending approval. We believe the only way the retreat rate could be revised so significantly would be by taking into account the stabilizing effect of seacave fills, which is not allowed per the Coastal Act and the city's LUP.

[1] https://documents.coastal.ca.gov/reports/2022/11/W17c/W17c-11-2022-exhibits.pdf (see exhibit 3)

We believe a more conservative and substantially higher estimate of the historical erosion rate than the recently revised 0.19 ft/yr used in Exhibit 8 of the current staff report[2] is warranted for several reasons.

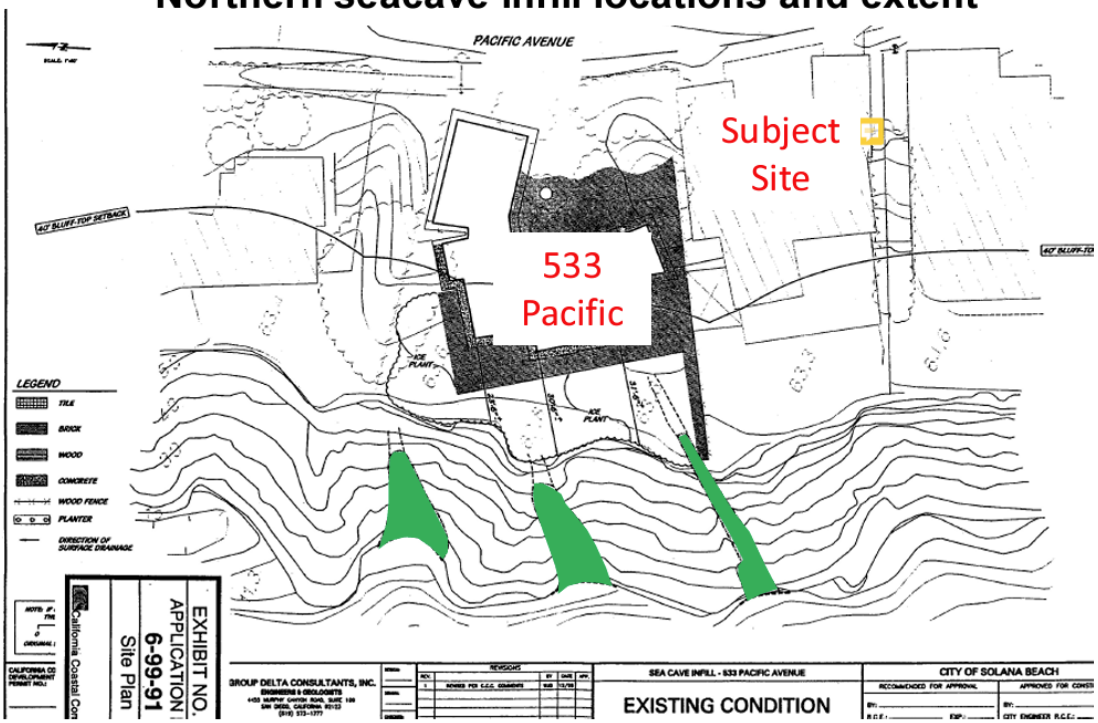
This newly revised calculation of an historical erosion rate of 0.19ft/yr appears to depend on the presence of shoreline protection devices including seacave fills at the subject site. The Commission's engineer determined the historical erosion rates by aerial photographs (Exhibit 8 page 3, Supplemental Memo: Revised Geologic Setback Analysis):.

> *"In an effort to reduce these uncertainties, I have made my own estimates of the historical retreat of the bluff at 525, 529 and 533 Pacific Ave. using overhead aerial photographs dating from 1932 – 2022. Over the past 90 years, the annualized bluff retreat rate at these three sites (along 18 separate transects) ranged from 0.11 – 0.32 ft/yr, with an average of 0.18 ft/yr, similar to the retreat rate estimate of GSI (2019). More importantly, except for the northernmost transect at 533 Pacific (with a retreat rate of 0.32 ft/yr), there was no appreciable difference in the historical bluff retreat rates across the three sites, and no indication that the sea caves beneath 525 and 533 Pacific have resulted in more rapid erosion at these sites over the long term.*
>
> *"The results of this independent analysis lend confidence to the historical retreat rate estimate provided by the applicant, and reduce my prior concern about future "flanking" of new development at 529 Pacific Ave. due to more rapid bluff retreat at the neighboring sites. On this basis, I conclude that the site-specific historical retreat rate estimate of 0.19 ft/yr can be used as a starting point for projecting future long-term bluff retreat at the project site."*

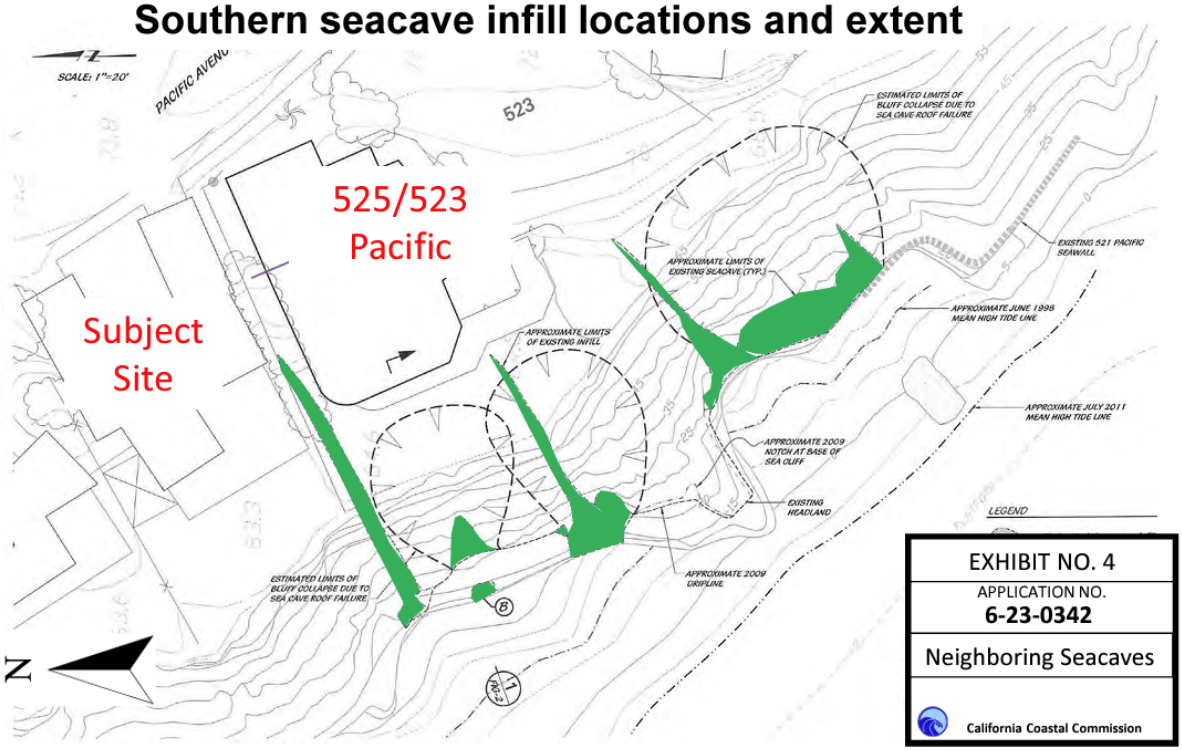
Retreat rates determined in this way would inherently be biased by the presence of the seacave fills as deep as 75 ft in the immediate vicinity of the site. These caves were filled as early as 1987 and at the latest by 2000, with additional fills and repairs in 2014.[3] Thus aerial photography methods of determining erosion are biased by the presence of this coastal armoring. Exhibit 4 shows the seacaves as filled by the neighboring property's permits.

[2] https://documents.coastal.ca.gov/reports/2023/12/Th16c/Th16c-12-2023-exhibits.pdf
[3] Page 12 of current staff report

Northern seacave infill locations and extent



Southern seacave infill locations and extent



The retreat analysis using aerial photos inherently includes the fact that seacave infills reduce erosion rates. Such an analysis is in direct contradiction with Coastal Act Section 30253 requirements that new development setbacks not rely on the presence of shoreline protection. Using shoreline protection in determining the GSL is also contrary to the GSL requirements in Solana Beach's certified LUP. The GSL must be determined absent the presence of shoreline protection per the certified LUP.

A more appropriate methodology would be to take core samples to determine the geology of the bluff and then perform stability analysis for those segments as well as including the impacts of seacaves if they were unfilled. For this reason alone, we believe the historical erosion rate and the GSL are vastly underestimated and must be revised to remove any doubt that shoreline protection was used in GSL determination. Furthermore, the core samples could not include cave infill material. Lastly, hydrological analysis of the expansion of these seacaves, if unprotected over the installed period and in the future, should be used to properly determine erosion rates. The expansion of these caves should have been factored into both historical and predicted retreat rates, but erroneously this has not been done. The aerial photography or observed retreat rates inherently remove the impact of these long existing seacaves on erosion rates.

Absent core samples, the Army Corps of Engineering conducted a study in 2012 used to justify the imminent Army Corps of Engineers Sand Nourishment Project. The Army Corps's Study determined historical erosion rates were much higher at the subject site. The Army Corps found rates of between 0.4-1.2 ft/yr historically as opposed to 0.19 ft/yr assumed in this recently revised determination (Exhibit 8). These Army Corps erosion rates were used to provide a cost benefit analysis for the project as approved by the Coastal Commission. The information cited below is in Appendix A (Substantive File Documents) of the Commission's Staff Report for Federal Consistency as heard on 11-11-2013 by the Commission.[4] The Army Corps' erosion rates were calculated based on marine erosion rates of unprotected notches caused by waves and similar attacks. The notches were assumed unstable at a depth of 6-7ft based on structural analysis of the bluffs. The subsequent bluff collapses that lead to blufftop erosion would cause a commensurate failure on the blufftop. See for example "Encinitas-Solana Beach Coastal Storm Damage Reduction Project. San Diego County, California , Appendix C, Geotechnical Engineering" U.S. Army Corps of Engineers, Los Angeles District, December 18, 2012 at page C-39.[5] (note Reach 8 is from the northern border of Solana Beach to Fletcher Cove, and includes the current project at 529 Pacific Ave).

[4] https://documents.coastal.ca.gov/reports/2013/11/Th11a-11-2013.pdf (Appendix A starts on page 59)

[5] https://www.spl.usace.army.mil/Portals/17/docs/projectsstudies/Encinitas_Solana/Appendices_A_D_(VolumeII).pdf

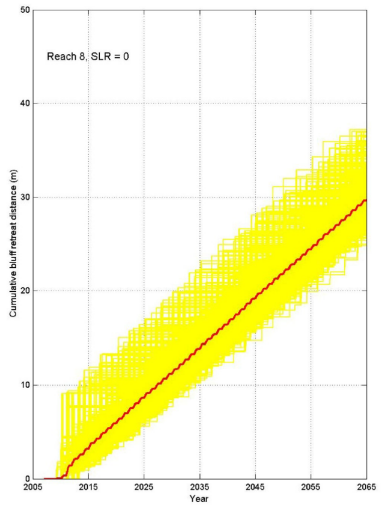
"7.3.8 Reach 8 Since the 1997-98 El Niño storm season, this reach has experienced over 30 significant cliff failures, destabilizing approximately 1,675 ft, or 47 percent, of this reach, in most instances undermining and destabilizing the upper terrace deposits. During the same time period, upper-bluff failures impacting bluff-top improvements occurred at nine locations, affecting approximately 410 ft, or 12 percent of this reach, with the maximum extent of bluff-top loss extending upwards of 16 ft back from the top of the coastal bluff. Unlike the Encinitas coastline, the Solana Beach upper-bluff profile is somewhat more uniform, with an average terrace 1 thickness on the order of 55 ft, and an upper-bluff inclination on the order of 45 degrees. With these relatively steep slopes, the static factor of safety is on the order of 1.1, and once marine erosion undermines the upper terrace deposits, the factor of safety of the upper terrace drops to about 1.0, with the clean sands initially raveling and then failures propagating up to the top of the slope. Although bluff-top failure dimensions can exceed the amount of marine erosion triggering the upper-bluff failure, on average, over the next 50 years, it is estimated that the rate of upper-bluff retreat can be no more than the rate of marine erosion, with a maximum upper-bluff retreat rate in Reach 8 approaching 1.2 ft per year, assuming no shoreline stabilization. The variability in the erosion resistance of the sea cliff within Reach 8 (and particularly at the north end of Reach 8, which is somewhat sheltered by Table Tops Reef), upper-bluff erosion within the north-most reaches is estimated to be as low as 0.4 foot per year.

Note that the Army Corp's retreat rate for these coastal bluffs ranges from 0.4 to 1.2 ft per year. This lower limit of 0.4 ft/year is still significantly higher than this recently revised retreat rate of 0.19 ft/year. The Army Corps specifically calculated this rate assuming no shoreline stabilization, in contrast to this recently revised rate which appears to include the stabilizing effects of the sea cave in-fills.

See also Encinitas-Solana Beach Coastal Storm Damage Reduction Project. San Diego County, California, Appendix C, Coastal Engineering at Appendix B, showing similar historical simulation absent SLR.[6]

page B-113, Figure 5.2-40 Simulated Bluff Failures at Reach 8 without Sea Level Rise	Page B-114 Table 5.2-6 Modeled Bluff Retreat Averaged Over 1000 Simulations Under Without SLR conditions

6 https://www.spl.usace.army.mil/Portals/17/docs/projectsstudies/Encinitas_Solana/Appendices_A_D_(VolumeII).pdf



Simulated Bluff Failures at Reach 8 without Sea Level Rise

Table 5.2-6 Modeled Bluff Retreat Averaged Over 1000 Simulations Under Without SLR conditions

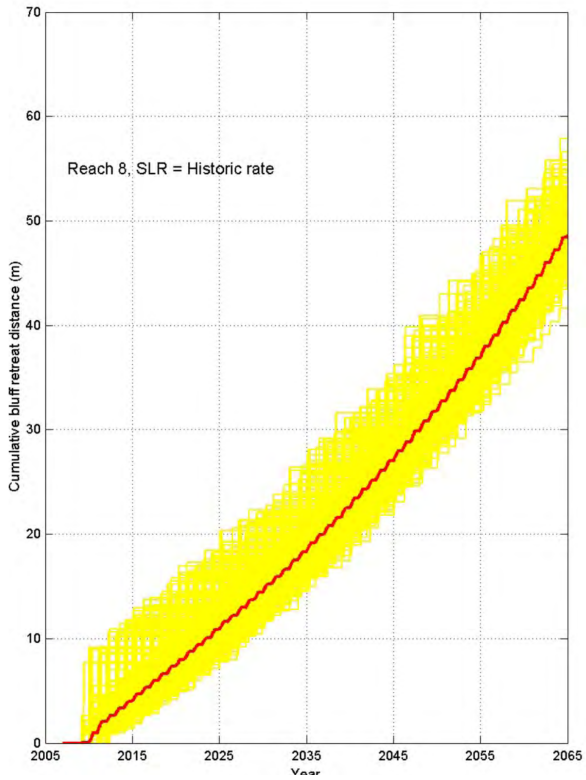
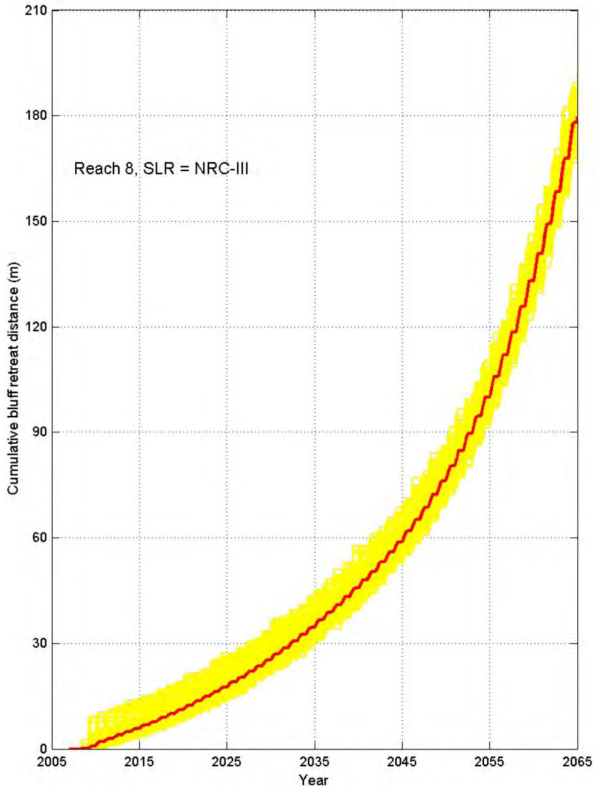
Reach	Cumulative Bluff Retreat Over 50 years (ft)	Annualized Bluff Retreat (ft/yr)	Geologically Averaged Bluff Retreat Rate (ft/yr)*
1	0.0	0.0	0.2
2	14.1	0.3	0.3 – 0.5
3	80.4	1.6	1.2
4	44.3	0.9	1.0
5	48.6	1.0	0.2 – 0.6
6	0.3	0.007	0.1 – 1.0
7	N/A	N/A	N/A
8	83.7	1.7	0.4 – 1.2
9	92.5	1.9	0.4 – 1.2

*: from USACE-LAD, 2003

When sea level rise was included by the Army Corps, the results were even more significant even though the Army Corps used less aggressive SLR assumptions:

Year	Low (Historic extrapolation)	Intermediate (NRC Curve I)	High (NRC Curve III)
1992 (mid-point 1983-2001 epoch)	0.0 ft	0.0 ft	0.0 ft
2018 (start of planning horizon)	0.2 ft	0.4 ft	0.4 ft
2068 (end of planning horizon)	0.5 ft	1.8 ft	2.5 ft

Table 5.2-1 Future Sea Level Rise Scenario, Page B-62, Appendix B – Coastal Engineering, Encinitas-Solana Beach Shoreline Study

Page B-122 Figure 5.2-48 Simulated Bluff Failures at Reach 8 Based on Historic SLR	Page B-130 Figure 5.2-56 Simulated Bluff Failures at Reach 8 Based on NRC-III SLR
	

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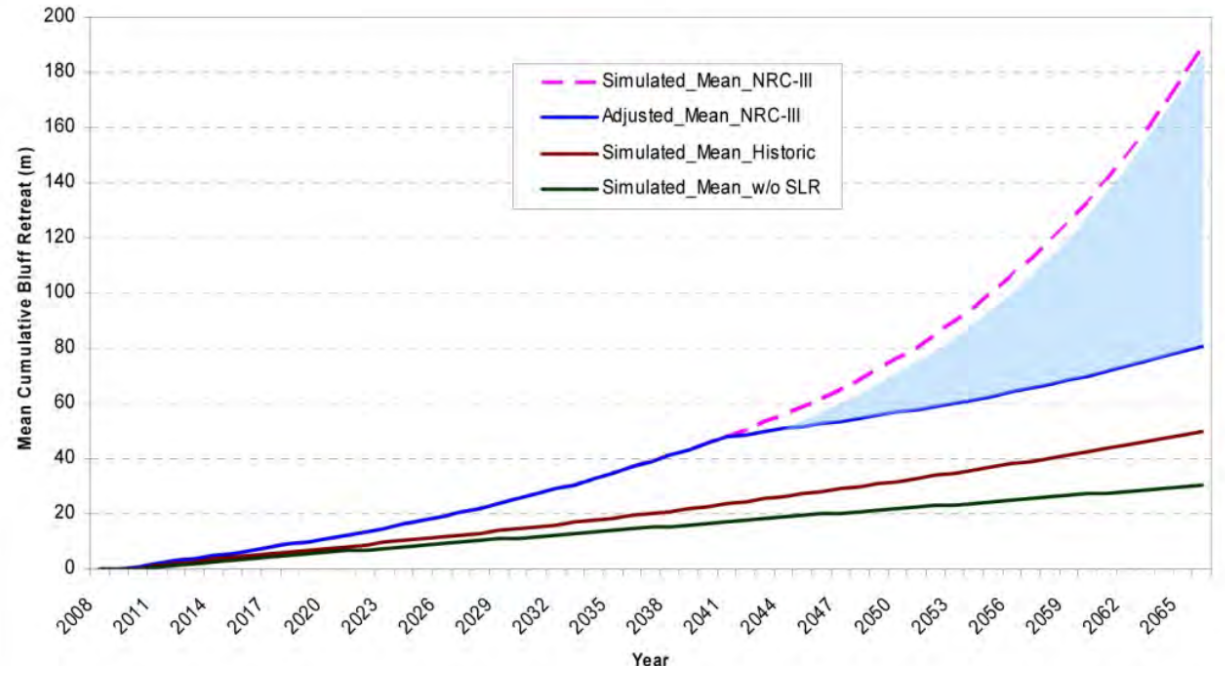

Figure 5.2-61 Comparison of Predicted Mean Bluff Retreats in Reaches 8 and 9 Appendix B – Coastal Engineering Encinitas-Solana Beach Shoreline Study (page B-135)

The Army Corps found much higher erosion rates at the subject site. These rates were certified in the Federal Consistency Hearing on 11-11-2013 and by the City of Solana Beach when it certified the EIR/EIS and by the Army Corps when it certified the project.

Substantial evidence supporting a higher retreat rate than 0.19 ft/yr can be also found in the May 2014 Staff Report for CDP-13-0948, 523-525 Pacific Avenue, Bannasch[7] referenced herein as well as in the Staff Report for Pollack's application. In that 2014 report, a rate of 0.3 ft/yr was used to calculate mitigation fees for the impacts of shoreline armor adjacent to the subject site as in the Staff Report .

[7] https://documents.coastal.ca.gov/reports/2014/5/W16b-5-2014.pdf

Site-specific values for equation variables:

S = 0.75

W = 26 ft (see attached Site Plan, Figure 2)

L = 20 years

R = 0.3 ft/yr retreat rate

H = $h_s + h_u$ = 65 ft

$\mathbf{R_{cu}}$ = 0.3 ft/yr

$\mathbf{R_{cs}}$ = 0

Sand Cost = $16.29/cy

In 2009, bids were obtained from three contractors to provide approximately 3,000 cy of sand for a nearby project. Copies of those bids are attached. The average sand cost of the three bids is $16.29/cy, which we have used for this project.

Assuming $R_{cu} = R$ and $R_{cs} = 0$, V_b can be simplified as follows:

$$(S \times W \times L \times R \times (h_s + h_u))/27$$

Thus,

$$V_b = 0.75 \times 26 \times 20 \times 0.3 \times 65/27$$

$$V_b = 281.7\ yd^3$$

Less volume of sea cave that would not have contributed to V_b:

Sea Cave Volume for 6 ft of erosion $= \frac{74+120}{2} x \frac{6}{27} x 0.75 = 16.2cy$ (see attached Sea Cave Volume Calculation, Figure 1)

Net $V_b = 281.7 - 16.2 = 265.5$ cy

Sand Mitigation Fee = 265.5 x $16.29/yd = $4,325

Recreational Use Fee Deposit for Infill C at $1,000 per lf:

For 31 ft, Recreational Use Fee Deposit = $31,000

Total Mitigation & Deposit = $35,325

CDP 6-13-0948 (Bannasch) Staff Report Exhibit 8.

> *"The area affected by passive erosion can be approximated by multiplying the 26 linear feet of bluff, by the annual expected erosion rate. The applicant's geotechnical consultant estimated the average bluff recession for this site at 0.3 feet per year. Every year that the seawall extension is in place would will in a loss of 7.8 sq. ft. of beach that would have been created if the back beach had not been fixed by the seawall."* (emphasis added)
> CDP 6-13-0948 (Bannasch) Staff Report Page 36[8]

Additional substantial evidence supporting a higher retreat rate is in the City's certified LUP Appendix C, Public Beach Recreation Impact Fee at Page 3.

> *"The Bluff Retreat Rate (Per Linear Ft.) in Table 1 is equal to one linear ft. (Bluff Retreat Length) multiplied by 20 years of estimated erosion multiplied by the*

[8] https://documents.coastal.ca.gov/reports/2014/5/W16b-5-2014.pdf

use value of one sq. ft. of beach. It represents the use value of the expected beach area that would otherwise be available for public use through passive erosion if the Bluff Retention Device was not constructed. An erosion rate of 0.4 ft. per year is assumed between 2016 and 2025 and an erosion rate of 0.673 is assumed between the years 2026 and 2046. Any change to the estimated erosion rate will require an amendment to the certified LUP. The use value increases each year to reflect an estimated 2% CPI."
LUP Appendix C, Public Beach Recreation Impact Fee at Page 3[9]

Note that CDP 6-13-0948 was approved prior to the LUP amendment certification explaining the lower rate used. If that permit were to be presented today or amended, a higher rate consistent with the certified LUP would be required.

Based on the preponderance of information above, we ask that the underestimated erosion rate be adjusted higher based on more rigorous approaches to retreat rate determination than aerial photography. Higher retreat rates are also justified by neighboring site-specific retreat rates, the city's LUP, and the Army Corps retreat rate for this region of Solana Beach that specifically excludes shoreline armoring. Retreat rate determination must also rely on the historical and future absence of seacave fills.

We also believe that due to errors and omissions in the applicant's Geological Report, their calculated retreat rate and GSL is incorrect. The City of Solana Beach's engineer stated, in his April 11, 2021 letter about this proposed project, that the stability analysis included material filled in the cave. He continued to state that the concrete in the cave behaved the same as natural bluff material. This analysis is inaccurate, as a filled cave is clearly more stable than an unfilled cave and is not the natural condition of the bluff. Additionally, stability analysis and therefore calculation of the GSL cannot take into account shoreline armoring per Solana Beach LUP:

Policy 4.18: A legally permitted bluff retention device shall not be factored into setback calculations….

Including cave fill for the determination of the GSL was therefore incorrect. We do not believe the Commission Geologist's Report removed the additional stability provided by the seacave fill when determining stability and GLS setback in the 2022 staff report. While the 2022 recommendation to deny remained unchanged as either way the proposed development is seaward of the GLS, the situation is even worse than presented by the current geotechnical reports.

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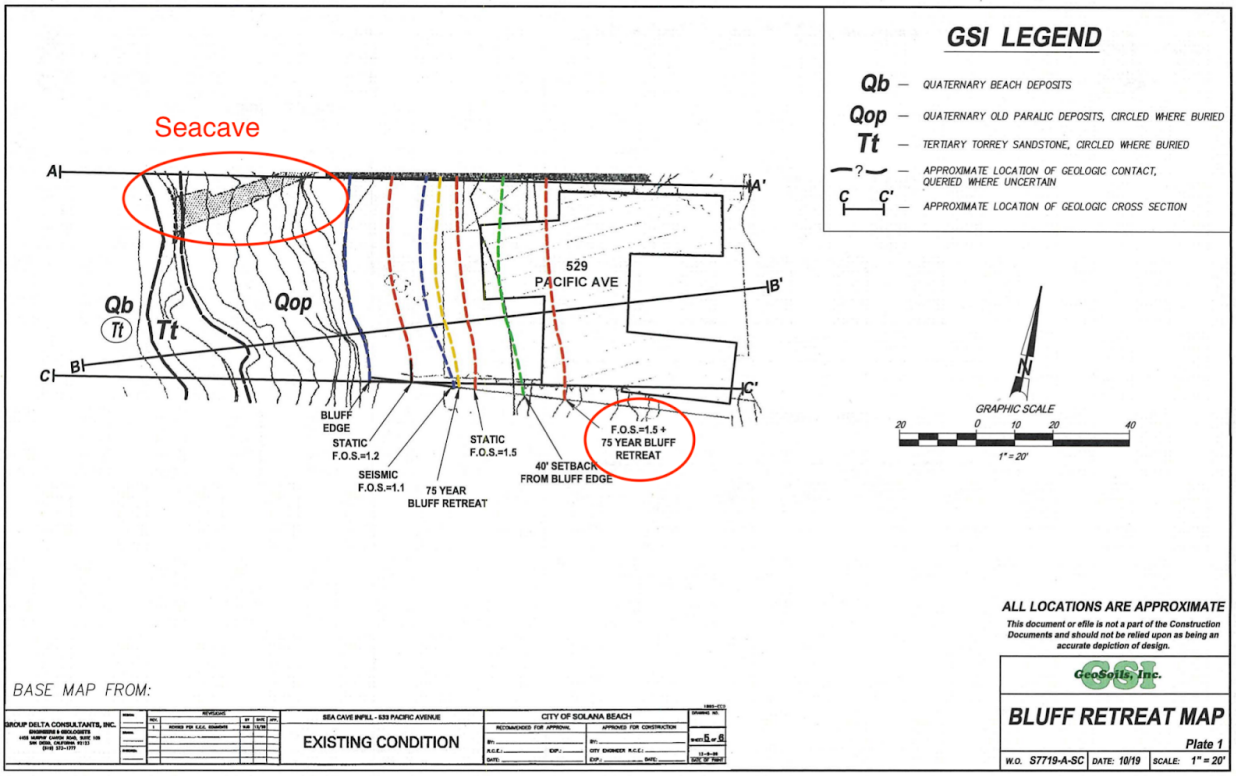
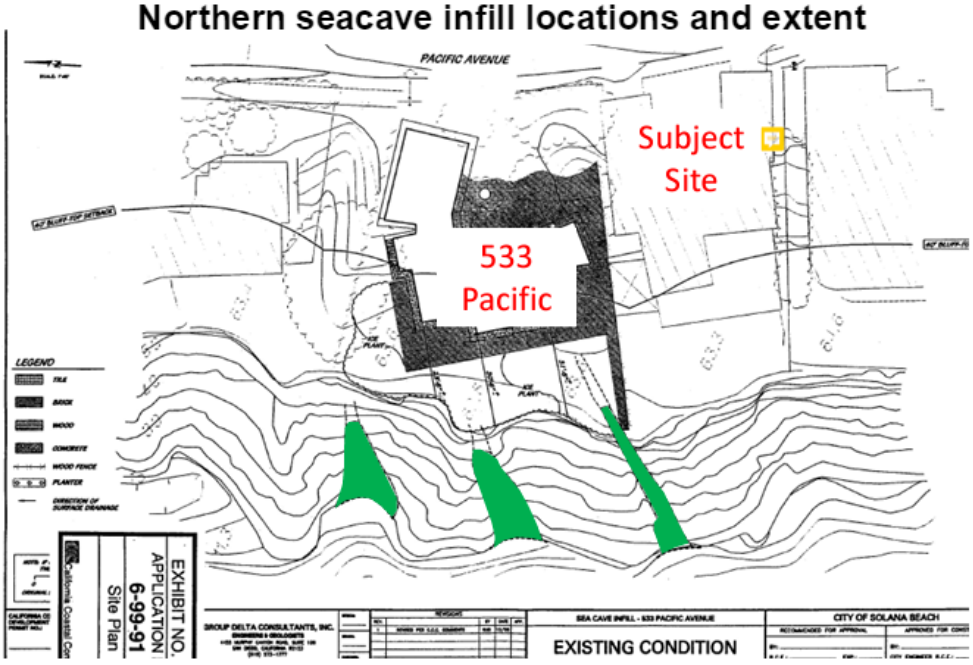
9 https://www.cityofsolanabeach.org/sites/default/files/Solana%20Beach/Community%20Development/Shoreline%20Management/Documents/LCPLUP-AppendixC.pdf

The plate below from GeoSoils report indicates the criticality of proper determination of the GSL. (Plate 1, page 74 of City's 2021 staff report). The GSL indicating a Factor of Safety of 1.5 and 75 years of erosion is represented by the red dotted line on the right, landward of the 40 feet setback. Also visible in the plate is a filled seacave which is a shoreline protective device. This is shown by the gray shaded area (circled by us in red) that intersects the cross section A-A'.

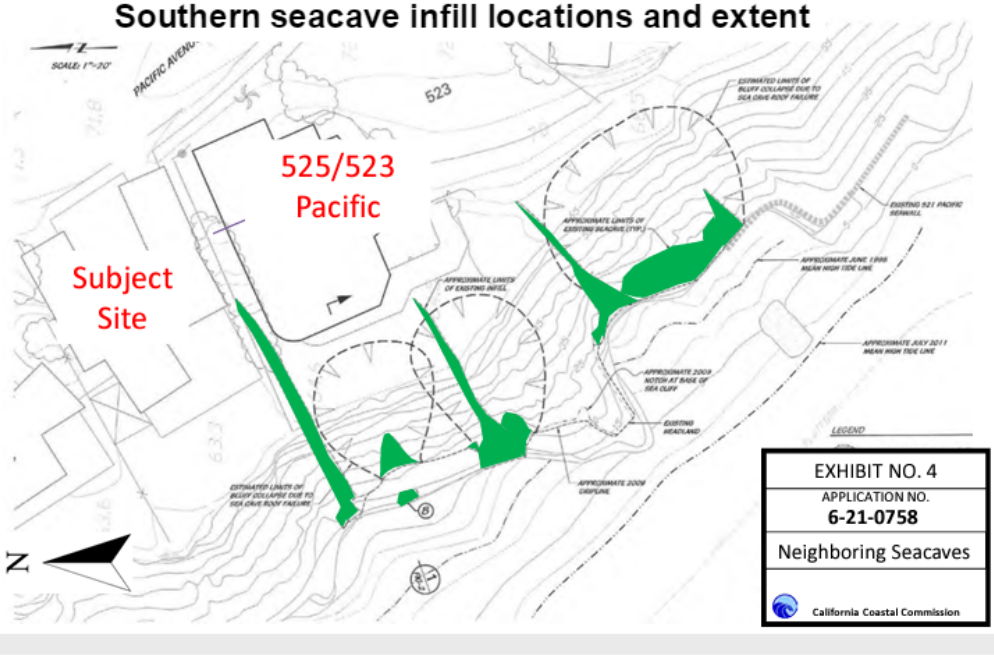


The Coastal Commission exhibits demonstrate even more clearly the location of the existing seacave fills and the proximity to cross sections A-A' and C-C' relied on for stability analysis.

Northern seacave infill locations and extent



Southern seacave infill locations and extent



From the above exhibits illustrating the northern and southern seacaves that bracket the subject site at 529 Pacific Ave, it is evident that the cross sections A-A' and C-C' traverse filled seacaves. Therefore, the stability analysis relies on shoreline protection of filled seacaves in the calculation of stability factors. This analysis is in contrast with the requirement that stability analysis not rely on existing shoreline protection. Therefore

we respectfully request that the stability analysis be supplemented with stability factors calculated assuming the seacaves are unfilled. In that way the Commission can rely on proper substantial evidence in making its findings to deny this permit.

To summarize: both the Coastal Act and the city's LUP support denial of this proposed development. Additionally, the geotechnical analysis and GSL should be updated to correct for the fact that the stability analysis incorrectly relied upon filled seacaves. An analysis should be done to calculate stability absent any fill of existing seacaves on both the north and south sides of 529 Pacific Ave.

Sincerely,

Kristin Brinner & Jim Jaffee
Residents of Solana Beach
Co-Leads of the Beach Preservation Committee
San Diego County Chapter, Surfrider Foundation

Mitch Silverstein
Policy Coordinator
San Diego County Chapter, Surfrider Foundation