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Coastal Property Rights, Land Use & Litigation

January 25, 2018

Dr. Terry Gaasterland, Chair
Sea Level Rise Technical Advisory Committee (STAC)
City of Del Mar
2010 Jimmy Durante Blvd., Suite 100
Del Mar, CA 92014

Re: Comments on the STAC's Managed Retreat Memo

Dear Chair Gaasterland and Honorable STAC Members:

We represent the Del Mar Beach Preservation Coalition, a California mutual benefit corporation that represents the interests of Del Mar's property owners, residents, businesses, and visitors who wish to preserve the City's cherished beaches, beach culture, beach neighborhoods and seaside charm. The BPC believes that beach sand nourishment and sand retention projects are the best and perhaps only way to preserve Del Mar's future for generations to come. The BPC supports STAC's promotion and prioritization of beach nourishment and sand replenishment as a primary adaptation strategy and encourages the City to aggressively pursue any and all opportunities to bring more sand to Del Mar's beaches.

The BPC reviewed the draft Managed Retreat memo, which has been styled as a possible Chapter 10 or a memo to be included with the STAC report. We believe that this document, if revised as set forth in the attached redline, should be included as a memo with the STAC report, and not as a Chapter 10. As revised, the memo would also include a copy of the white paper authored by renowned coastal engineer Walter F. Crampton, P.E., G.E. titled "The Infeasibility of Managed Retreat for the City of Del Mar: A White Paper." To our knowledge, this paper is the only science-based analysis available to the STAC that addresses managed retreat in Del Mar on a site-specific basis. As its title suggests, Mr. Crampton concludes that managed retreat is not feasible in Del Mar and supports the STAC's exclusion of managed retreat as a SLR adaptation strategy.

Thank you for allowing the BPC to participate in this process, and for incorporating its comments in the final report. We look forward to continuing to actively collaborate with STAC and other City officials as Del Mar navigates this process together.

Sincerely yours,

Jon Corn
cc: BPC Board

~~CHAPTER 10 or Memo: Managed Retreat~~ With BPC REDLINES

Managed Retreat in Del Mar

The Sea Level Rise Adaptation Plan aims to keep risks related to sea-level-rise within acceptable limits. The planning process identified vulnerabilities in the City of Del Mar, considered strategies to limit risks, and evaluated the feasibility and application of those strategies within the context of Del Mar. Adaptation options fall into three categories. They can **protect** property, for example, through improved sea walls, levees, beach replenishment, or river channel dredging. They can **accommodate** changes due to sea level rise, for example, by raising structures or adding sediment to wetlands to maintain vegetation elevations. The third category of adaptation options involves “**managed retreat**” and became the focus of much debate, discussion, and deliberation. Adaptation through managed retreat allows wetlands to migrate and expand; requires the relocations—relocation of public infrastructure, including, for example, roads, utilities, sewers, storm drains, fiber optic cables, roadways, and railroad equipment; ~~and creates incentives to remove or relocate private property when extreme risks arise.~~

As STAC deliberated and received communications from the citizens of Del Mar, managed retreat through wetland migration and expansion never raised issues (However, wetland migration and expansion was never discussed in the context of its potential impacts, direct and indirect, on private property. If it was, it likely would have also raised issues). Del Mar values the San Dieguito River and river-mouth, its associated wetlands, its beaches, and its bluffs as important natural resources. Protecting these resources and ensuring access emerged as a high priority. Likewise, managed retreat through relocation of public infrastructure was ~~broadly~~ accepted to the extent such relocation did not affect private property, including access and habitability. Public buildings at risk include the fire station, the sewer lift station and park facilities, including the Del Mar Community Center. Other vulnerable public infrastructure provides essential services to citizens and access to beaches, bluffs, and lagoon for public benefit and enjoyment, and access to private property by owners, tenants, visitors, maintenance professionals, and life safety personnel. They include sewage management, internet access, storm drainage, transportation and parking, lifeguard stations, and public safety equipment. Ensuring the future of both natural resources and public infrastructure through accommodation or relocation (assuming no impacts to private property through such relocation) was well accepted throughout the STAC

process. The Adaptation Plan includes options at all levels – protect, accommodate, retreat – for Del Mar’s shared vulnerable resources.

In contrast, managed retreat ~~options~~ as a adaptation strategy for private property emerged as contentious and fraught with economic, legal, societal, and multi-faceted financial impacts. This Chapter/Memo aims to review and summarize two and a half years of structured discussion among STAC members and citizens of Del Mar regarding managed retreat as applied to private property.

10.1 State guidance is lacking on retreat in urbanized beachfront

Sea level rise adaptation strategies aim to manage risks to Del Mar's public and private property, natural resources, infrastructure and assets. Consideration of managed retreat as an adaptation strategy involved a wide range of perspectives, a high level of emotional response, and fundamental disagreement over whether and how to include "managed retreat" in the Adaptation Plan as an adaptation strategy.

The State guidance [C1] on managed retreat discusses retreat as an approach to allow shorelines to migrate inland. In Del Mar, this view of managed retreat is insufficient as guidance for planning for amending the LCP, especially in light of Del Mar's topography. The City of Del Mar includes over two miles of high density, urbanized beachfront, both at beach level and atop ocean bluffs. Residents and visitors have unfettered access to pristine, broad Del Mar's beaches. Both Del Mar's beachgoers and over 600 homes at beach-level, and lower, would be negatively impacted by managed retreat. Retreat and Landward migration of the shoreline, if left unchecked by sand replenishment activities, would mean the replacement-inundation of an-a much cherished urban environment (currently developed with hundreds of private homes, restaurants, visitor serving businesses, most of Del Mar's lower cost housing, a motel, parks, a community center and associated roads and public infrastructure) with wetlands and river, and eventually ocean.

While the State guidance emphasizes "prioritizing natural infrastructure", it lacks discussion and analysis on retreat in an urbanized context, and fails to assess the physical, economic and societal impacts that retreat may cause in densely developed coastal towns like Del Mar. The State guidance document also fails to address the fiscal impact that managed retreat would cause on City finances, erosion of the tax base, urban blight, and the cost and risk of the litigation that would inevitably be prosecuted by some property and business owners. The State guidance simply also assumes that managed retreat would help maintain a useable beach area, without taking into account local conditions such as the conditions that exist in Del Mar, although the validity of this assumption is uncertain. For example, the North Beach area is unique because the the oceanfront homes are constructed on land that is 6 to 8 feet higher in elevation than the 600 or so homes to the east, homes will depend on existing seawalls for protection in the event of extreme SLR conditions.

Expanded State guidance, along with objective analyses of the fiscal, geographic and physical impacts on Del Mar and its residents and property owners, is needed to consider fully analyze how managed retreat may or may not be suitable-viable SLR adaptation strategy in Del Mar specifically, and more generally in urbanized shorelines or in areas where there is no contiguous open space for the shoreline to migrate inland and connect

to. To be clear, additional site-specific scientific, engineering, and economic information is very much needed to assess the efficacy of a managed retreat policy, and the full impact of managed retreat on Del Mar, especially in the North Beach area.

Without balanced and informed guidance, along with reliable studies that address the physical, fiscal, and societal impacts of ~~on~~ retreat in urbanized, medium-density beachfront areas, ~~local groups must apply common sense and values when considering retreat~~ neither the STAC nor the City is in a position to consider managed retreat as a viable adaptation strategy to potential sea level rise. In short, existing State guidance prioritizes natural infrastructure without addressing the economic and legal impacts of replacing private property with wetlands and beaches and introducing substantial new risk of flooding to adjacent private properties and public infrastructure. This perspective is being voiced at the local level in Del Mar. The State guidance documents lack adaptation examples applicable to Del Mar's established beachfront neighborhoods, where oceanfront homes and seawalls are at higher elevations than the properties and infrastructure to their east.

The documents defer to a jurisdiction's risk tolerance and lack discussion of how to apply managed retreat to an urbanized beachfront via the Local Coastal Program Amendment process, and do not adequately address the myriad critical issues that managed retreat implies for the City of Del Mar, its property and business owners, residents, and visitors.

10.2 STAC consideration of managed retreat in Del Mar

In Del Mar's sea level rise policy planning process, managed retreat for private property was the most controversial issue that the STAC committee evaluated and debated. ~~The committee has been and continues to be nearly equally divided on this issue.~~ Over a ~~two and a half year~~ two-and-a-half-year period, the committee established its position on private property managed retreat. In the first year of deliberations, managed retreat was included in the STAC's draft Sea Level Rise Adaptation Plan as an option for all regions (wetlands, river, bluffs and beaches). In the second year, STAC, with an unchanged membership,

the STAC evaluated the impacts and implications of managed retreat to each area and realized that for Del Mar, managed retreat of private property had profound economic, societal, and legal implications, and could, in fact, increase risks rather than limit them. That is, it could do more harm than good (i.e., it could destroy property, the City's tax base, tourism economy, and the City's character with little or no public benefit). For these reasons, STAC decided to exclude private property managed retreat completely in its final version of the document.

Further, STAC requested the City Council add two additional STAC members from the beach level neighborhoods.

10.3 Foundations of STAC's position on managed retreat

STAC's position on managed retreat for private property resulted from discussion, debate, and evaluation of the following factors:

1. The voter approved Beach Protection Initiative (BPI) and certified City of Del Mar Local Coastal Program allow seawalls in the beachfront region from 15th St. north to the river-mouth. Generations of property owners have relied in good faith on the BPI and made significant financial investments based on the assurances contained therein.
2. Vocal and committed community engagement on private property managed retreat clarified that it will impose significant costs to Del Mar, and that the effectiveness of managed retreat in Del Mar as a SLR adaptation strategy is unproven and potentially harmful. For example, the inclusion now of private property managed retreat strategies will increase market uncertainty and potentially reduce land values at a time when much remains unknown regarding how SLR will evolve over the short and long term, and whether not managed retreat is even a viable option. Anecdotal evidence already suggests that even the STAC's discussions regarding private party managed retreat has chilled the real estate market in North Beach.
3. Approaches to managing coastal erosion have different distributions of benefits and costs to community at local and regional levels. Hard engineering options (e.g., sea walls) may protect community or private assets but the beach in front of the structure is likely to erode, resulting in potential loss of beach may narrow with SLR, in the absence of sand replenishment activities. In such a case, beach amenity and use for locals and visitors are lost could be reduced in favor of protecting homes and or infrastructure upland property, infrastructure and existing roadways and railways; and significant downstream impacts (e.g., loss of tourism industry) may also occur. On the other hand, it is unknown whether or not managed retreat will would protect beach amenity and public use given Del Mar's unique topography at the expense of property and infrastructure.

4. The committee determined that the City of Del Mar would benefit from a better understanding of the future implications of seawalls in North Beach. Further, the City would benefit from investigating all possible adaptation options that have potential both to maintain the beach and to protect property before starting to consider private property managed retreat strategies.
5. Success of hard and soft engineering options is highly dependent on the nature of the physical environment, the affordability of the mitigation measures and successfully negotiating an outcome that reconciles different contending interests. Some managed retreat actions may well emerge as a component of other adaptations as balanced, well-considered projects are planned.
6. The STAC has not been presented with and is not aware of any science-based study or engineering analysis that demonstrates the feasibility of managed retreat in Del Mar, or anywhere for that matter. The STAC has read and reviewed the white paper entitled “The Infeasibility of Managed Retreat for the City of Del Mar” by Walter F. Crampton, P.E., G.E. of TerraCosta Consulting (www.terracosta.com). In this study, Mr. Crampton, a coastal engineer with more than 40 years of experience, concludes that managed retreat is not feasible in Del Mar. The full report is attached hereto as Appendix A, and its conclusion is summarized by Mr. Crampton as follows:

In summary, one of the features that make the City of Del Mar’s, and particularly Del Mar’s North Beach, so unique is its coastal geology or, more specifically, its geomorphology or the evolution of this very unique coastal city. Del Mar’s North Beach is truly unique and along the state’s 1,100-mile coastline, is one of only nine small coastal segments having similar geomorphology. Del Mar’s unique geomorphic character lies in its location at the mouth of the San Dieguito River, with the San Diego Lagoon creating a truly unique coastal experience along Del Mar’s approximately 4,400-foot-long North Beach. For the reasons explained above, so-called “managed retreat” is not a viable adaptation strategy for potential sea level rise in Del Mar, and it would not result in any tangible public benefits. At the same time, it would likely have detrimental economic and societal impacts.

7. ~~There~~For all these reasons, there was ~~general consensus~~discussion within the committee that managed retreat should be considered as a potential adaptation strategy, but only as a last resort after all other adaptation strategies have been fully evaluated and determined not to be viable, and a majority of the committee believed that managed retreat should not be included in the City's SLR adaptation policy statements, or the LCP, unless and until it could be demonstrated that the theorized public benefits of managed retreat outweighed the public risks, the private costs, and societal impacts.

10.4 Next steps

The challenge for the Planning Commission and the City Council in developing coastal policy over the next decade will be to design and implement institutional arrangements that prevent and/or resolve legal, financial, engineering and social conflicts in coastal locations threatened by accelerated Sea Level Rise. Many government agencies and key stakeholders argue that there is a need to mitigate the risks of SLR by modifying the coastal urban planning framework. However, strong evidence indicates that risk mitigation policies that are unpopular and socially divisive in the shorter term will not be accepted over the long term. In general, policies designed to manage long term risks tend to be controversial. Therefore, community involvement will continue to be central to the success of strategies for gaining public acceptance of schemes designed to reduce long-term risks.

Finally, the public should be engaged in deciding how to manage the long-term risks of SLR and in determining the actions to be undertaken under various SLR scenarios. While public engagement is time consuming and expensive, it is important for policy makers to understand and respond to community concerns, match policy to community needs wherever possible, and give the community a greater sense of ownership over the design and implementation of new policy. It is critically important that the Planning Commission and the City Council understand the perspective and decision-making criteria that property owners employ to make sense of proposed SLR risk mitigation policies. For a managed retreat policy not to further heighten social, economic, legal and political conflicts, both the Planning Commission and the City Council must define a process to understand the concerns of various constituents and engage in dialogue with the community.

10.5 Addendum: Range of positions on managed retreat

STAC MEMBER 1 (KB): Address managed retreat now.

We need to face the issue of Sea Level Rise head on, now, proactively. By removing managed retreat as an adaptation option from the Adaptation Study, we have removed what might be our only option once seas have risen above a certain level. When this will

occur, no one knows. Originally we tied the managed retreat option to the amount of sea level rise, frequency of coastal flooding, and the loss of a walkable beach. By coupling retreat to these triggers, we were not saying when retreat might be necessary. We were simply reinforcing two of the STAC's guiding principles: maintaining a walkable

beach and reducing flood risk. Without retreat as an option, we have abandoned these guiding principle. Under the high SLR scenario, beaches in Del Mar will be lost if the back of the beach is fixed by sea walls. Low-lying areas in North Beach will be continually flooded by storm and high-wave events. No amount of sand replenishment, sand retention devices, or even the complete restoration of natural sand supply through returning rivers to their undammed state will be able to prevent beach loss and flooding if the beaches are not allowed to move inland in face of rising tides. How to compensate private property owners and how to manage the process of retreat are important questions that will take years, possibly decades to work out. We need to start that conversation now. By removing retreat as an option, we are deciding against starting this difficult conversation. By removing retreat as an option, we will be forced to react quickly, without as much time to examine the financial, legal, and social issues associated with managed retreat. Decisions are better made with time and information; by removing retreat as an option, we may be forced to make decisions quickly, without all of the needed information, and our options will be more limited.

The entire STAC voted overwhelmingly in support of these guiding principles. These guiding principles were not made in isolation - they are supported by the California Coastal Act and the Del Mar Community Plan. The public has an inherent right of access to and along all beaches and shorelines. We have not acted in the beach-going public's or the community of Del Mar's best interests by removing retreat as an adaptation option. The beaches are a public trust, and belong to every Californian. Without retreat as an option, we are abandoning our beaches in interest of the protection of private property, contrary to the laws and guidelines of Del Mar and the state of California.

STAC MEMBER 2: (MH) Classic Free Rider Problem of Sea level Rise.

Sea-level rise is by definition a phenomenon that affects every California coastal community as a result of CO₂ emissions. When it comes to reducing carbon emissions there is a classic free rider problem. The free rider problem is a market failure that occurs when people take advantage of being able to use a common resource, or collective good, without paying for it, as is the case when citizens of a country utilize public goods without paying their fair share in taxes. Coastal communities would benefit from lower emissions by relying on the public to make sacrifices and reduce their pollution levels. Sea-level rise is to a large extent caused by externalities. When you drive an SUV, the contribution to climate change and sea-level rise is an external cost which you don't experience personally. Free markets are notoriously bad at including external costs in prices. The consequence is that there is over-consumption of goods which pollute and cause sea level rise. In theory, economics has a solution to the problem of externalities. If you can work out the external cost of driving an SUV, you can place a suitable tax to make people pay the social cost and reduce demand to the

socially efficient level. The difficulty is working out and then agreeing on a suitable external cost. If the real cost of climate change and sea level rise is as high as current science indicates, it would suggest carbon emitting vehicles are seriously undertaxed and the social cost of carbon emissions is much higher than current legislation suggests. The difficulty then also becomes convincing the general public that due to the external costs of pollution there is a need to establish a carbon tax to acquire private property via managed retreat.

STAC MEMBER 2 (MH): Consideration of private property managed retreat is premature and requires additional local and state guidance.

As a result of the free rider problem, it is clear that a private property managed retreat policy will impose the most significant and unfair costs on affected coastal communities. Another problem with sea-level rise is that there is tremendous uncertainty about the future costs of sea-level rise. The imposition of private property managed retreat strategies for pre-existing communities will certainly increase market uncertainty and reduce land values. Local communities should adopt voter-approved initiatives similar to New Zealand, where the Queensland Sustainable Planning Act requires local councils to compensate owners when a planning decision reduces property values (section 704). Thus, local communities need to resist private property managed retreat strategies until a dedicated statewide funding source is created. It is recommended that a dedicated State of California funding source, such as a carbon tax, for fair market land acquisition be established before private property managed retreat is required in any community plan. A voter proposition on the California ballot would be the best way for California to determine if the public values their beaches enough to impose a carbon tax. If the California people do value their beaches, then they should be more than willing to impose a state-wide carbon tax to implement private property managed retreat. In summary, private property managed retreat is a complicated issue that the voters of California should decide.

STAC MEMBER 3 (RC): Public beach access depends on protection and accommodation

Sea Level Rise is an environmental change that all beach goers and Del Mar residents will need to adapt to any changes that occur. We do not know exactly how much sea level will rise and when it will occur or how soon. With this Adaptation Plan, Del Mar will now gather monthly and yearly data in order to identify any changes. As changes occur, it will be important that adaptation options are thoroughly reviewed including any new options being used nationally and internationally. One example to monitor is the research of the effectiveness of different shapes of seawalls in Japan.

STAC has acted in the interest of both the beach-going public and the Del Mar residents. A walkable beach is a high priority with our residents and visitors! STAC with

Del Mar resident input reviewed the option of managed retreat of private property and together most believe it is not appropriate at this time. There are so many options to be reviewed and utilized before any discussion ever needs to take place regarding managed retreat of private property. There are over 600 homes in the Del Mar beach community with the homes along the beach behind sea walls at about 13 feet above sea level. East of the beach, the homes and properties decrease to eventually 3 feet above sea level before reaching the railroad tracks. In addition, within the beach community, over 800 (waiting for confirmation) public parking spaces allow public access to the beach. If the homes are gone, the parking is gone, beach access is gone and now the visitors and residents are gone! Where is the walkable beach?

Before any discussion of managed retreat of private property begins, an engineering evaluation of the beach community and managed retreat needs to be completed. I direct you to the technical paper titled “The Practicality of Managed Retreat” written by expert Walter Crampton.

Therefore, managed retreat of private property is not an appropriate adaptation option to be included in this Del Mar plan.

STAC MEMBER 4 (TG): Managed retreat applies differently across Del Mar’s diverse regions

Protecting our natural resources in Del Mar – our beaches, our wetlands, our bluffs – is a top priority and drove much of STAC’s deliberation. Del Mar’s natural resources include a wide sandy beach ranging from urbanized oceanfront to high bluffs fronted by broad sand and reefs that make waves ideal for surfing. Del Mar residents and visitors enjoy running and walking on the beach, spending hours on a sunny day near the surf with towels, picnics, and happy children at play. Surfers from far and wide join the local surf crowds at 8th St, 11th St, and 15th St and on down to the river-mouth. Beach enjoyment happens year-round, in all months. On nearly every day of the year, runners and walkers can continue for nearly 3 miles from lagoon to lagoon – albeit at low tide only when winter storms have washed the beach sand into the offshore reefs.

This beach resource, complemented by Del Mar’s canyon paths and wetland overlooks, comprises Del Mar’s most important asset. It draws newcomers and visitors and adds great value to homes and businesses. It must be protected, nourished, and cared for with highest priority as sea level rise planning moves forward.

Del Mar’s STAC studied the many adaptation options identified throughout California as the state and other localities evaluated vulnerabilities and how to minimize them. STAC has drafted this Adaptation Plan to minimize risks in all areas of Del Mar. Protection and accommodation options will be the most important while sea level rise remains steady and slow. STAC regarded managed retreat as wise for some areas, including the

lagoon wetlands and the bluff tops. However, STAC recognized, with much community input, that managed retreat in the oceanfront area of North Beach has complexities and implications that go far beyond the guidance received from the State. Specifically, STAC came to understand that managed retreat in the beach-level communities means losing beach access, putting sea-level (or below) homes to the east at greater risk, and loss of property, infrastructure, and resources.

In short, STAC could see clearly how managed retreat options can be applied in wetlands and bluffs, but could not come to census or develop a clear view of how managed retreat options could apply in the urbanized oceanfront areas without introducing new vulnerabilities, loss, and risk. Many other options to protect and accommodate have yet to be explored in detail. Many are promising and have potential to maintain Del Mar's natural resources in much their current state for many decades to come. Thus, STAC decided – in a vote that involved all members, after much community input – it is premature to include managed retreat for private property in the current STAC draft Adaptation Plan.

[INSERT OTHER STAC MEMBER POSITIONS HERE]

10.6 Addendum: STAC Discussion on managed retreat 12/7/2017

[Keep the following discussion in this document? Or make sure points are included above in 10.5?]

Gabe: Wants to understand the rationale for sub-c changes, particularly to eliminate MR. The identified overall goal of maintaining a walkable beach is still good. If the beach persists that will protect the DM character going forward. Some of the changes to the AP take away from that. Don't understand why removal of retreat is proposed. We are building a tool box— Managed Retreat (MR) may be an appropriate tool in 30-40 years even if not now; it does disservice to the long range focus of the planning effort to eliminate it from the AP. Focusing only on sand replenishment is not enough. Sand is not an infinite resource; not appropriate as the only strategy. MR should not be done home by home—may take 10-20 years to set up implementation mechanisms; if the AP eliminates MR now, we are pushing this issue way down the line. Doing that raises bigger econ. issues. The AP is missing the needed info to justify eliminating MR—STAC needs the sed. mgmt. plan, to understand and analyze not just local options for DM but also how to be part of regional sand solutions—all this is required to do effective sand replenishment—not just DM grabbing sand it wants.

Terry: Sub-committee charged with taking input, beach community concerned with retreat. Retreat remains for public property. Felt it was difficult for committee to impose language on private owners that could have negative financial impacts by including MR in a public report.

Amanda: AP will be updated regularly. Concern for harm from addressing MR in the AP, and for its removal, was based on current conditions—option is still there if conditions change. Goals are in the plan to preserve the beach—don't have solutions to allow it to persist overtime, absent a sed. mgmt. plan that says we can do that.

Robin: DM is unique—homes on beach, if the AP tells them to retreat, it diminishes value—waiting for an AP amendment down the road when MR is needed is better than including MR language now.

Kristen: STAC goal was to assess impacts based on science. Science is reality. The rev'd draft AP is suppressing info if MR is not included out of fear of private finance impacts when the science is otherwise. Financial impacts to inland properties from seawalls is documented in studies. If beaches go, all property values impacted, not just the front row. The science is clear on MR—fixing back of beach is diametrically opposed to preserving a walkable beach.

Kim: Opposed to MR—has already hurt the market. Lots can happen in 10-15 years. Might have better options in the future—unconscionable to put MR in doc.

Nancy: How does MR contribute to a walkable beach? Won't we end up with inland lagoon?

Gabe: If the back of beach is fixed, the beach can't retreat naturally, the beach will gradually be lost. If STAC waits too long to deal with this issue we will be reacting, not planning ahead.

John: Will beach meander if walls removed?

Gabe: Gabe is not advocating for pulling the seawalls out—is a complex situation, but many homes are built in hazard area. Should be a community wide solution. There are options. For example, a plan to pull seawalls back 15 feet in 2075, might allow the beach to persist—there are options.

Nancy: Take out walls, higher homes in front row. Not a beach any more.

Gabe: Might be options like a dune solution. For example, may need to plan to retreat to accommodate a dune field when certain thresholds are met.

Bruce: Take some of the heat off Gabe—the ocean is changing in ways it hasn't before. Risk posed is substantial. Bruce forwarded a recent paper on natural options for addressing SLR. It addresses alternatives to seawalls, such as wetlands restoration, dunes, etc. These options are very time consuming, expensive, to do right. Taking out MR words, is upsetting, but will mean we attack the problem in a more rushed and expensive fashion—nobody wants MR until we absolutely have to do it. We don't know how much SLR is coming and when—we only know it's happening and accelerating. Understand impacts to values, etc. but hard armoring accelerates beach loss. Replenishment is a half measure—we need to address all measures that will address the problems—we hired the best science consultants, yet we are taking one of their main

recommendations off the table. Bruce can't put his name on a report that takes MR off the table as to private but not public properties—intellectually doesn't make sense.

Robin: DM has done nothing. Sand replenishment done eons ago. Now hearing we are going to MR.

Bruce—Not saying we are going to MR, it's a last resort, but don't take it off the table.

Mark: Had a consultant do the report, wasn't really oriented to DM; STAC then got lots of input, and opened our eyes. We struggled with input from the public. We followed the guidelines, but made some of our own. We need to do a survey of DM—what do the locals want to happen? Asking lay committee to make decisions without expertise—without econ and legal studies is not the right way. We need some kind of sand replenishment and retention—can't uncouple the two. One of first things DM can do is figure out sand retention. Some say the AP revisions are a step backward, but we took input of community and reflected it. Elected officials should make the decision, they are accountable to voters. City Council should make the decisions.

Kim: Against MR from what he has seen in last 50 years. Most sand lost in 70's, 80's 90's. Haven't seen as much loss in last 10-20 years. Not a critical need now. Need for MR is further off. SLR is happening more slowly. Scientists disagree—won't sign a doc. that includes MR.

John: If SLR goes up a couple feet, everyone will leave. But putting MR in the doc. now affects lending practice. Lenders will loan in flood zone, but not in an MR zone. This is why the words of the AP have current impact. John saw this with hurricane Sandy. MR makes sense from science and practical perspective, etc., but causes immediate finance problem. That's why John wants MR out—if we can work around the issue somehow, more power to us.

Nancy: Fanny and Freddie identify properties that are not eligible for loans, including properties that can't be built or rebuilt (reads excerpts of guidelines)

Kristen: How does this play into existing situation?

Nancy: Can't answer—just reporting the current regs from F &F.

Mark: This is a legal issue that needs to be reviewed.

Terry: We need a lengthy statement about MR in the report, reflecting both Gabe's and other perspectives. Explaining how and why we struggled with this difficult issue.

Mark: MR is last resort, we should pursue all other options. All agree.

MOTION: Write a discussion about MR as discussed at STAC committee. Include the struggles and perspectives on MR. Make explicit why MR left out of the AP.

Yes: Kim, Bruce, Mark, Robin, Terry, Kristen

2 abstentions: Nancy and Gabe
Motion passes.



Geotechnical Engineering
Coastal Engineering
Maritime Engineering

The Infeasibility of Managed Retreat for the City of Del Mar: A White Paper

The California Coastal Commission Sea Level Rise Policy Guidance Document provides a chapter on adaptation strategies to effectively address coastal hazard risks and to protect coastal resources, accounting for the uncertainties surrounding projections of sea level rise over the next century and beyond. The Commission document notes that adaptation strategies should be chosen based on the specific risks and vulnerabilities of a region or project site, and the applicable Coastal Act and Local Coastal Plan (LCP) requirements, with due consideration of local priorities and goals. Adaptation strategies may involve modifications to land use plans, regulatory changes, project modifications, or permit conditions that focus on avoidance or minimization of risks and the protection of coastal resources. The adaptation options described in Chapter 7 of the Commission's Sea Level Rise Policy Guidance Document are intended to provide guidance for potential LCP and permitting strategies. It is important to recognize that not all strategies listed in Chapter 7 are or will be appropriate for every jurisdiction, as each represents unique geographies and geomorphologies.

Chapter 9 of the Sea Level Rise Stakeholder Technical Advisory Committee (STAC) Report dated January 11, 2018, summarizes the viable beach erosion and flooding adaptation strategies considered appropriate for Del Mar. Notably absent from Del Mar's beach erosion and flooding adaptation strategies is the concept of managed retreat. Coastal Commission Staff argue that this adaptation strategy must be included in the City of Del Mar's Adaptation Plan. The Coastal Commission's Sea Level Rise Policy Guidance Document provides significant discussion and recommendations for incorporating managed retreat into future LCPs to help property owners (public and private) plan for and address future sea level rise, storm surge, coastal flooding, and erosion. **Given the available technical data, it would appear that managed retreat is not a viable adaptation strategy for the City's North Beach and Valley Districts and has not been included in the City of Del Mar's Sea Level Rise Adaptation Plan.** The basis for this conclusion follows.

The City of Del Mar's Unique Geology and Geomorphology

Given the Coastal Commission's current stance against shoreline protection devices, it is conceivable how certain agencies, along with environmental groups, could possibly embrace

managed retreat as a viable adaptation strategy for preserving the City of Del Mar's unique coastal beach experience. However, one of the features that makes the City of Del Mar's, and particularly Del Mar's North Beach, so unique is its coastal geology or, more specifically, its geomorphology or the evolution of this very unique coastal city. Del Mar's North Beach is truly unique and along the state's 1,100-mile coastline, is one of only nine small coastal segments having similar geomorphology. Del Mar's unique geomorphic character lies in its location at the mouth of the San Dieguito River, with the San Diego Lagoon creating a truly unique coastal experience along Del Mar's approximately 4,400-foot-long North Beach.

In the recent geologic past, the San Dieguito River mouth, as it empties into the ocean, would migrate from the City's northerly headlands adjacent Dog Beach southerly down to Power House Park, with the actual active width of the river mouth only several hundred feet wide to maintain the necessary ebb flow tidal velocities to keep the river mouth open.

During the last ice age about 18,000 years ago when sea level was about 400 feet lower and the shoreline at the time about 2½ miles further seaward, North Del Mar was a coastal valley not unlike San Diego's Mission Valley, with a relatively level valley floor with its elevation about 120 feet below the sea level of today; albeit still about 280 feet above the ancestral shoreline at the time. This ancestral shoreline represents the edge of the very gently sloping continental shelf through which all of the major ancestral rivers have incised as all of the coastal rivers flowed westward. As sea level again rose after the last ice age, these ancestral rivers became drowned out, with river sediments then deposited within these incised submarine and now-buried ancestral rivers. Interestingly, the ancestral San Dieguito River, in 60 feet of water (or about 4,000 feet offshore), is where SANDAG mined substantial quantities of sand for its regional beach nourishment projects in both 2001 and 2012, with this ancestral sand source off of Del Mar representing a very good quality coarse alluvial sediment, and used it on several of San Diego's North County beaches in 2001, and again in 2012.

As sea level continued to rise up to contemporary times, the coastal lagoons – including the San Dieguito Lagoon – were eventually filled in with alluvial sediments, with the surface of the San Dieguito Lagoon today, although somewhat variable in elevation, typically at no more than elevation +3 feet NGVD 29. It is on this contemporary lagoonal surface that man extended both roadway embankments and a railroad embankment, the Del Mar Fairgrounds,

and of course at least the eastern portion of the urban area we now refer to as Del Mar's North Beach.

The seaward face of this lagoonal deposition was then further affected by longshore sand transport within the 52-mile-long Oceanside Littoral Cell. Alongshore sand transport is driven by waves breaking at an angle to the shoreline. It is generally southward in winter and northward in summer. Estimates of long-term transport potential for the Oceanside Littoral Cell average about 750,000 cubic yards per year to the south, and 550,000 cubic yards per year to the north (USACOE, 1991). This means that a total of about 1.3 million cubic yards of gross sand transport per year are capable of being mobilized, with a net southward rate of about 200,000 cubic yards per year.

It is this longshore sand transport that further alters the seaward edge of the lagoon, with the foreshore (in the presence of sufficient sand) created and built up as normal waves passing through the surf zone place material in suspension, thus loading the uprush water with sand. The broken wave swashes up the beach face, with its water percolating through it, eventually to be returned back to sea. The down rush is smaller than the uprush due to this percolation, and therefore cannot carry much of the sediment load back down the beach face, with the process causing the beach to accrete. The backshore, and ultimately the beach berm itself, is a result of the landward accretion from waves during more severe storms.

Within the recent geologic past in Del Mar, this beach berm formed along the seaward edge of the San Dieguito Lagoon, with the crest of the beach berm being relatively uniform at about elevation +13 feet NGVD 29, and it was on this back beach that the first row of houses were constructed in Del Mar running from Power House Park to the river mouth. The width of the beach berm across the river mouth was also relatively uniform, with its seaward edge since being eroded away. However, its landward edge more or less coaligns with Ocean Front, which exists throughout Del Mar North at around elevation +10 feet. The back of the beach berm continues to descend at a relatively uniform slope down to Camino Del Mar, which is typically around elevation +7 feet. Easterly of Camino Del Mar extending to the railroad embankment, the ground surface drops to a relatively uniform topographic low of around +6 feet, creating a relatively large basin between Camino Del Mar and the railroad tracks that, at times, has experienced flooding when waters exceed the capacity to drain northerly back to the San Dieguito River. An illustrative cross section is provided (Figure 1) through Del Mar's North Beach, easterly to the railroad tracks and then continuing easterly

into the San Dieguito Lagoon. While the cross section shown on Figure 1A was drawn with no vertical exaggeration and shows the relatively flat Del Mar North Beach area, Figure 1B, with a 10 to 1 vertical exaggeration, clearly shows this very unique geomorphic condition that only exists along eight other river/lagoon mouths along the 1,100-mile-long California coastline; namely, San Diego's Mission Beach, Newport's Harbor Island, Sunset Beach, Alamitos Bay Peninsula, Channel Islands Harbor Beach, Ventura, Carpinteria-Sand Point, and Moss Landing just south of San Francisco.

Figure 1 also includes a typical seawall protecting the seaward-most row of North Beach homes, with a top-of-wall elevation of +15 feet. Upon reflection, it should be obvious that if the seaward row of homes along Del Mar's North Beach were removed to accommodate planned retreat, the next row of houses on the east side of Ocean Front are typically about 3 feet lower in elevation and presumably would need even a higher seawall elevation, say at +16 to +18 feet, or 6 to 8 feet above the first-floor of the next row of residences.

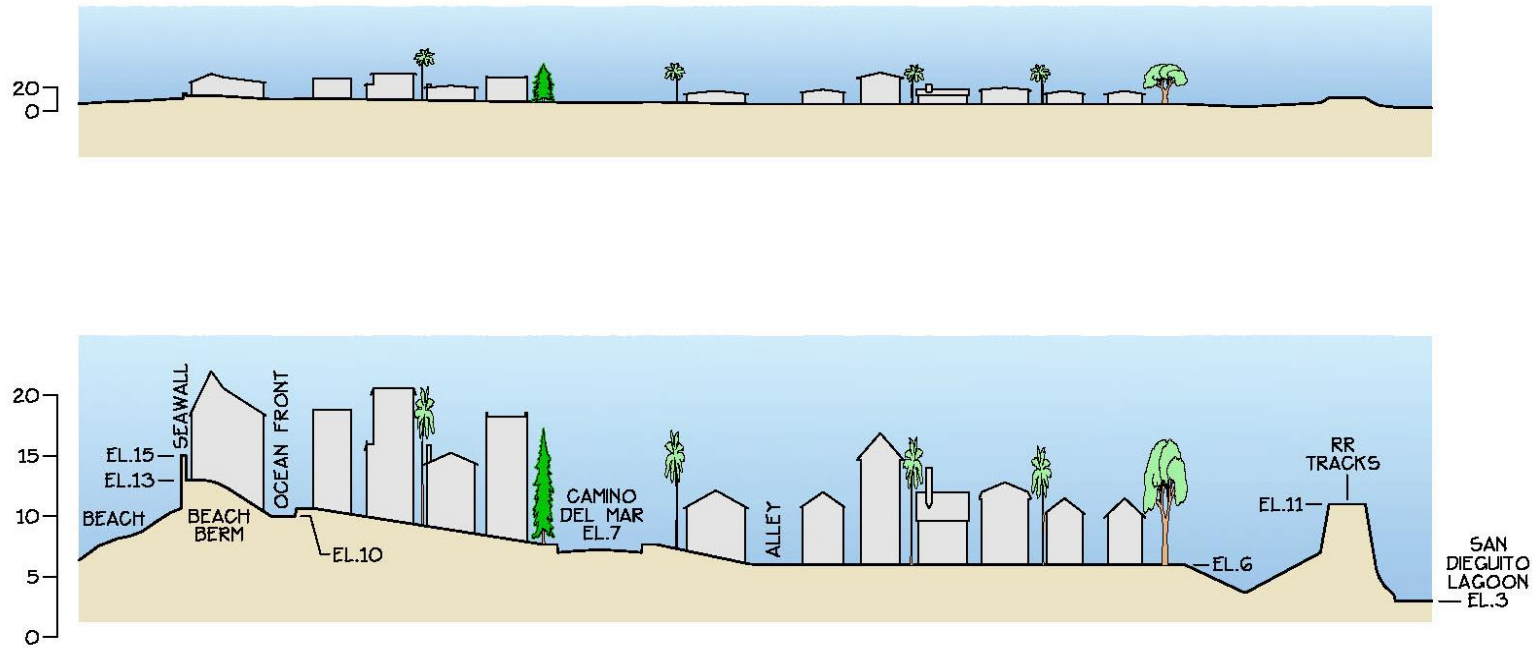


Figure 1: Typical seawall protecting the seaward-most row of North Beach homes, with a top-of-wall elevation of +15 feet

As reach progressive row of residences is removed, the coastal erosion problem becomes more acute, with each easterly seawall required to become taller in elevation, completely at odds with the guiding land use goals and principles outlined in Chapter 2 of the STAC Report.

The adaptation strategies outlined in Chapters 8 and 9 of the STAC Report work well for the City of Del Mar, while in contrast, managed retreat, at least in this very unique geomorphic environment, cannot work and still provide the goals espoused by the citizens of Del Mar and the City's elected officials.

The economic value of this state's beaches is undisputed, particularly in Del Mar, and given the specter of a potential one, to worst case two meter rise in sea level by the end of the 21st century, beach nourishment remains a viable adaptation strategy, particularly when incorporating sand retention structures, with the annualized cost of beach nourishment incredibly small compared to the wholesale loss of the 600+ residences in North Beach.

An ongoing beach nourishment program meets the objectives of the Public Policy Institute's Program for California Coastal Management with the changing climate, and similarly achieves the objectives of saving the beach by James Titus.

The Fallacy of Utilizing the Worst-Case Sea Level Rise Scenario

In recognition of the Coastal Commission's interest in addressing worst-case scenarios, there is an amount of sea level rise beyond which additional stabilization no longer makes sense. For example, under a worst-case scenario, if there were 10 feet of sea level rise, none of the proposed adaptation strategies described in Chapters 8 or 9 would likely be sufficient to resist this worst-case scenario, and at that point in time, we anticipate that there would be general agreement that retreat would remain the only viable option. In lieu of managed retreat, under this scenario, we would anticipate a consensus agreement for what we would refer to as "wholesale retreat" under a worst-case scenario. This, of course, is very different from managed retreat in that wholesale retreat would require the abandonment and removal of essentially all low-lying improvements northerly of Power House Park, returning this area to an environment not unlike San Elijo Lagoon today. Under that worst-case scenario, and depending upon the continued commitment from Caltrans, the railroad, and other interested agencies, transportation and utility corridors across the restored San Dieguito Lagoon could

be similar to the infrastructure that crosses San Elijo Lagoon today.

To put this worst-case SLR scenario into perspective, which we will arbitrarily define as more than 2 meters of sea level rise over the next century, researchers at Scripps Institution of Oceanography currently estimate that the probability of 2 meters of sea level rise by the year 2100 is at 1/2 percent. As a practical matter, 2 meters of sea level rise can be accommodated by the year 2100 through beach nourishment protecting Del Mar North's approximately 1.4-km-long beach (assuming the use of sand retention structures) at a total cost of less than \$1 million per year (Flick and Ewing, 2009).

Using the above example, we conclude that the beach erosion adaptation strategies described in Chapter 9 remain both viable and economical through the year 2100, with an exceedingly low probability of a more severe SLR scenario beyond which Del Mar's North Beach community might consider wholesale retreat.

Concern has also been raised regarding the availability of an economical sand source for future beach nourishment projects. As described previously, sand sources for SANDAG's 2001 and 2012 Regional Beach Sand Projects were mined from San Diego County's ancestral offshore rivers below 60 feet of water depth on the continental shelf. Current estimates for the still-available offshore sand volume within the ancestral San Dieguito River Valley exceed 2 million cubic yards, with a still available sand supply within the ancestral San Diego River likely exceeding several billion cubic yards of relatively clean coarse alluvial sediments suitable for beach nourishment well into the next century. In short, significant quantities of excellent quality coarse granular alluvial sediments exist in San Diego's nearshore environment, exceeding any anticipated San Diego County beach nourishment needs over the next century.

Jurisdictions with Similar Geography and Geomorphology to Del Mar

There are several jurisdictions across the California coast that share similar geomorphology to that at Del Mar's North Beach. Namely, a beach berm, in all instances with a descending back beach sloping down to a lagoonal back bay. They include the following:



1 Reinhard E. Flick and Lesley C. Ewing, 2009, Sand volume needs of southern California beaches as a function of future sea level rise rates, in *Shore & Beach*, Vol. 77, No. 4, Fall 2009.

Area	Comments
Mission Beach	Locally as narrow as 550 feet in width. Beach berm elevation is around +13 feet. Back beach steps down initially to about +10 feet, and then further down to about +6 feet.
Newport-Harbor Island	Harbor Island, where it fronts the Pacific, ranges from 300 to 700 feet in width, with the bike trail around elevation +12 feet, and Balboa Blvd stepping down to about +7 feet.
Newport- Balboa Island	This island is within Newport Harbor as much as 1,500 feet in width and drops in elevation from about +10 feet to +7 feet, extending from south to north.
Sunset Beach	This is about 500 feet in width. Beach berm is at +13 feet, with South Pacific Ave stepping down to about +8 feet.
Alamitos Bay Peninsula	This is 350 to about 700 feet in width. Beach berm is around elevation +12 feet, with East Ocean Blvd at +7 feet.
Marina Del Rey	Although somewhat similar in geology to the other areas, this elevation consistently is around +16 feet and does not step down to the east, so I've not included Marina Del Rey in our list of back bays.
Channel Islands Harbor	Beach berm elevation around +13 feet. Ocean Drive around +12 feet. Sunset Lane around +9 feet. South Harbor Blvd around +6 feet.
Ventura	This area is interesting in that, while similar to Del Mar, there is also a series of groins at about 1,300 feet on center, with each groin about 400 feet in length.
Carpinteria-Sand Point	Sand Point is at about 250 to 350 feet wide. Sand Point has only one row of houses, so managed retreat would simply remove the entire row of houses and may not be appropriate. However, the geology remains similar.
Moss Landing	Back beach elevation is around +10 feet, and as with Carpinteria-Sand Point, has only a single row of buildings, so planned retreat would be simply removing all of the improvements in the area.

The fact that there are other similar locations that share Del Mar's unique geology and geomorphology only bolsters the case that "managed retreat" cannot be treated as a "one-size-fits-all" adaptation strategy that can be applied across the California coast.

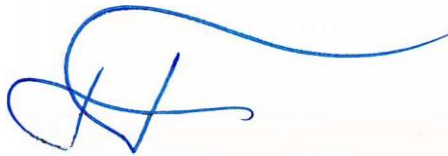
For example, the City of San Diego certified Local Coastal Program for the Mission Bay Planning Area does not address managed retreat. Currently, only the Ocean Beach Community Plan and Local Coastal Program mentions, “*The anticipated Citywide Adaptation Plan should include in its scope of work an assessment of potential measures to address the managed retreat or relocation of existing development at risk from bluff erosion or failure, and the degree to which property owners should assume risks associated with their properties in hazardous areas.*” Given this, it will be telling if the proposed Adaptation Plan (currently the City has not pursued such a Plan) will differentiate the unique geographies within the City’s coastline (i.e. the difference between Ocean Beach versus Mission Bay). The remaining jurisdictions’ Local Coastal Programs listed in the previous table make no mention of managed retreat and/or as a strategy specific to the unique geography of their beaches, bays, and harbors. That being said, all the jurisdictions are at very stages of development of the sea level rise adaptation policy development and will most likely come to the same conclusion as Del Mar in that managed retreat is not a practical adaptation strategy for certain geographies located within their coast line.

As of the writing of this Chapter, the only communities actively looking at managed retreat within their communities are the Cities of San Francisco, Pacifica, and Ventura. However, managed retreat is only being suggested for open space areas, public infrastructure, and not specifically residential. Additionally, the areas under consideration do not share the same geography and geomorphology as Del Mar.

Conclusion

In addition to the unfavorable geomorphic conditions, managed retreat is incompatible with Del Mar's voter-approved Beach Preservation Initiative (BPI) (Refer to Section 6 – Authorized Protection Structures and Section 8 – Issuance Shoreline Protection Permit). Furthermore, the implementation of managed retreat could endanger over \$1.5 billion of Del Mar's tax base and potentially the demographic diversity of Del Mar, as much of the majority of housing in the impacted lower-lying areas are apartments and multi-family housing. Lastly, managed retreat threatens public access as the arterial coast highway linking the City of Del Mar with surrounding beach communities, as much of the Pacific Coast Highway and the associated provision of free publically-available parking spaces would be negatively impacted by flooding.

In summary, one of the features that make the City of Del Mar's, and particularly Del Mar's North Beach, so unique is its coastal geology or, more specifically, its geomorphology or the evolution of this very unique coastal city. Del Mar's North Beach is truly unique and along the state's 1,100-mile coastline, is one of only nine small coastal segments having similar geomorphology. Del Mar's unique geomorphic character lies in its location at the mouth of the San Dieguito River, with the San Diego Lagoon creating a truly unique coastal experience along Del Mar's approximately 4,400-foot-long North Beach. For the reasons explained above, so-called "managed retreat" is not a viable adaptation strategy for potential sea level rise in Del Mar, and it would not result in any tangible public benefits. At the same time, it would likely have detrimental economic and societal impacts.



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