

Pinnipeds People Planet
Passionately protecting our precious marine life
Sharing our seas successfully
Helping people to help seals
Every seal counts



Charity number: 1162936

Call for input 2023 - structured public consultation: Removal activities under the Article 6.4 mechanism

The Seal Research Trust (SRT) is a multi-award winning, evidence based marine conservation charity in the UK. SRT welcomes the opportunity to participate in this consultation, particularly in relation to:

G. Avoidance of other negative environmental, social impacts

Discuss considerations to be given to core elements for avoidance of other negative environmental, social impacts; where possible, identifying the applicable scope, i.e., relevance to all 6.4 mechanism activities, to removals activities, or to specific removal activity categories or types.

SRT is committed to supporting vital renewable energy projects, corporate emission reduction programmes, personal actions to reduce carbon footprints (please follow this link to watch our most recent film about the impacts that climate change is already having on our native, heritage, UK speciality seals <https://youtu.be/KaJWpcP5p4g>) and nature based carbon dioxide removal (CDR) schemes for example salt marsh and seagrass restoration projects. SRT is keen to support essential climate solution innovations, as long as they:

- Are scientifically (not just theoretically) proven to be effective
- Based on thorough research prior to any ocean ecosystem trials
- Ideally have a biodiversity net gain (but certainly no negative impact on relevant ecosystems in accordance with the principles of SDGs 14, 15),
- Have robust key checks and balances in place to ensure that any potential change to the marine environment is detectable when ocean trials go ahead.

We are open-minded about exploring geoengineering solutions such as ocean alkalinity enhancement (OAE) projects like that of [Planetary Technology's](#) (PT), if the principles outlined above are rigidly applied. Our current and ongoing experience is with PT's trial project (based on methodologies already described by the UN as '[unproven with unknown risks](#)') in St Ives Bay, Cornwall. PT's experiment may yet be formally licenced and implemented in a vulnerable protected habitat. SRT remain unconvinced that the livelihood of those that rely upon St Ives Bay as well as its biota will not be irreparably damaged.

We outline the details of this useful case study later in the document, **but our specific asks to the UN are:**

- Create effective legislative frameworks and governance procedures to advise government agencies how to regulate and monitor CDR and OAE schemes effectively in terms of public consultation, impact assessments and monitoring.
- Create a central scrutiny body for all novel CDR, OAE and Geoengineering Schemes or require individual governments to create their own using relevant statutory agencies to do so, with whom all stakeholders can consult.
- Develop a checklist of minimum standards for all CDR, OAE and Geoengineering Schemes to meet in terms of carbon budget gains, net environmental and social gain for local communities.
- Provide a central list of relevant expertise that community groups and charitable agencies can consult with, when faced with a CDR, OAE or associated Geoengineering Scheme.
- Create an online compendium of user-friendly advice and guidance to upskill community groups and charitable agencies with a help desk. Share best practice and ideas about how to create a 'community voice' to balance that of big business.
- Enable an international monitoring and enforcement body to be set up to oversee and check that all CDR, OAE and Geoengineering Schemes outcomes actually match those initially planned. There needs to be an international mechanism to impose substantial fines and compensation schemes when things go wrong, including getting a commitment from companies (both financial and in terms of action) to do everything possible to rectify such an event.
- Funding for independent scientific research to be conducted in this arena as a matter of urgency.

In summary, SRT's position remains that we need to be sure that this project will not have any unintentional effects in a hugely biodiverse bay such as St Ives, whose triple bottom line is wholly dependent on the health of its marine ecosystem from fishing and tourism to mental health and wellbeing and all things in between. We also want to be sure that any effects – intentional or otherwise have temporal baselines and monitoring that make positive and/or negative change detectable. It does not seem plausible to make decisions solely on modelled outcomes, indirect measurements or other non-tangible approaches, as currently being proposed. It is vital that any project must be able to monitor, quantify, verify and report on the actual CDR before being approved. To date SRT remain very concerned about PT's project, particularly in terms of the feasibility of ongoing upscaling with substantial MH releases planned in St Ives Bay by PT over the long term. We owe it to future generations to get our decisions right.

Our requests are based on our community experience: St Ives Bay, Cornwall, UK Case study



St Ives Bay looking west

Cornwall and St Ives cannot afford to be a guinea pig for a project that could go wrong without thorough and robust science. St Ives Bay was previously recommended as an area to be designated as a Marine Conservation Zone in order to protect its diverse species and habitat, and was only removed from the shortlist in the final stages of consultation as a result of fisheries opposition. St Ives Bay is part of Cornwall's Area of Outstanding Natural Beauty and has the Harbour Porpoise Marine Special Area of Conservation to its north and east. There are Sites of Special Scientific Interest, where grey seals are a monitored feature, either side of the bay (Aire Point to Carrick Du and Godrevy to St Agnes); a Site of Special Scientific Interest designated in the tidal Hayle Estuary (Hayle Estuary & Carrack Gladden) to the south, which feeds into the bay and is vital bird habitat along with a Site of Special Scientific Interest (Gwithian to Mexico Towans) in the extensive dune system behind St Ives Bay. All these designated areas in close proximity to the release site could be impacted by any changes taking place in the bay.

St Ives Bay's ecosystem and economy cannot be put at risk, so SRT remain very concerned about the scaling up of this project AFTER the next experimental release. Long term, 24 hour release of magnesium hydroxide (MH) over multiple years into the bay will likely have unintentional and unforeseen consequences for our vital marine habitats and species. Communities all need to have a good understanding of what these impacts could look like (best and worst case scenario) before this project is licenced and goes ahead. We only have one ocean that is connected, so impacts in Cornwall's marine ecosystem will be transported by the gulf stream to other parts of the UK and beyond. This is serious given our own survival depends on healthy oceans.

OAE Scheme timeline

The first our charity heard about the proposed OAE Scheme by PT in St Ives Bay was on 19/01/23 at a Cornwall Marine Liaison Group meeting. Since then, it has been a very steep learning curve for us, our local community and partners.

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We have had to team up in order to collate the citizen and scientific expertise needed to even begin to get an understanding of such projects, their feasibility, limitations, potential and impacts.



St Ives Bay 'West Cornwall' mainland haul out of our native, heritage grey seals. (The UK has 34-38% of the entire world population of grey seals, making them a UK speciality species.)

We have since discovered that PT did an initial MH release into St Ives Bay in September 2022. They say they were told by the UK Environment Agency (EA: the relevant statutory regulatory body) to NOT go public about this release - something the EA have subsequently denied in writing. After the initial release of MH over 3 days in September 2022, SRT recorded an extraordinary change in seal behaviour with seals moving from their usual and long-established haul out on the east side of St Ives Bay, to a brand new haul out further east away from the bay for the first time in our 23 year recording period. Obviously, we understand that there is no way this can be directly attributed to the release at this time, but neither can we categorically say that the two events are not associated. Seals have one of the most sensitive muzzles in the mammal world, given that each whisker has 1500 nerve endings. This means what seals can sense in terms of even slight and subtle changes in water chemistry is incomprehensible to us humans without extensive future research. SRT will continue our citizen science monitoring programmes in both the Aire Point to Carrick Du and Godrevy to St Agnes SSSIs where seals are monitored features into the foreseeable future (along with the rest of our citizen science network across the SW UK). For background information, [one of our peer reviewed papers about Seal Photo ID research is accessible via this link](#).

At PT's request, SRT have drafted some additional marine mammal monitoring methods that should be undertaken to both inform them, science and us about marine mammal habitat use in the bay.

These include suggestions for PT to:

- Provide long term remote online (not public) timelapse camera monitoring of seals at Godrevy Island (nearest haul out to the east and within 1km of release site) in conjunction with Trinity House and in collaboration with SRT well before, during and long after any releases.
- Provide long term remote online (not public) timelapse camera monitoring of seals at the Carracks (nearest haul out to the west of the release site) in conjunction with landowners (possibly the Duchy of Cornwall) and in collaboration with SRT well before, during and long after any releases.
- Use fixed surface and underwater 360 cameras to monitor any marine mammal or other species activity around the outfall or interaction between them and the outfall well before, during and long after any releases.
- Fund research into the potential impacts of OAE on seals and cetaceans given their intelligence, acute senses and physiology with Exeter University Penryn Campus.

- Pioneer the use of eDNA water sampling in St Ives Bay to assess marine mammal presence in the recent past along with the University of Exeter Penryn Campus.
- Fund postmortems, as well as pollutant and toxin analysis for dead marine mammals washed up around Cornwall. The West Cornwall sensitive seal site closest to the outfall links places as far away as the Isle of Man (450km north) to S Devon and France, as proven by our Photo ID research, tracking individual seals from their unique fur patterns along with partner organisations doing similar work.
- Add to the existing passive acoustic monitoring network, by setting up an F Pod array for cetaceans in St Ives Bay with Chelonia (subject to Cornwall Wildlife Trust and Chelonia approval).

With another release looming back in March 2023, the local community had to act quickly and attend the two small and short public meetings planned in Hayle and Truro. Neither of these meetings went particularly well for PT and local community members were left shocked, angered and bemused at the lack of research, knowledge and awareness by PT about the local seawater in St Ives Bay (contaminated by historic mine outflows); its rich biodiversity (including globally rare grey seals and England's only inshore bottlenose dolphin pod, as well as a plethora of seabirds and other creatures) and the local economy that is heavily dependent on recreation and tourism.

As an evidence based marine conservation charity, SRT Trustees, Steering Group members and supporters are used to responding to public consultations run by statutory agencies and are familiar with marine licencing procedures. So, we were surprised that no public consultation had occurred prior to the first MH release that was undertaken with no prior Environmental Impact Assessment, with no baseline data collection about the prior state of the sea, seabed and biota and wholly unsatisfactory monitoring procedures to detect potential changes.

In the spirit of SDG 17 – Working in partnership

We have been informed by the media that the Environment Agency have commissioned an independent Environmental Impact Assessment. This is good news and we would like to ensure that whoever is carrying this out knows that SRT have long term baseline data for grey seal habitat use and abundance for the SSSI sites where seals are a monitored feature either side of the bay – West Cornwall (to the east with 4123 surveys over 23 years) and West Penwith North (to the west totalling 339 surveys from 2005 to the present day.)

To date we have had an open and very positive, ongoing dialogue with PT having already hosted face to face visits to our Trustees by Mike Kelland (PT CEO) and Pete Chagrin (PT Vice President, Commercialization and Community Relations).

We are concerned that PT have undertaken just 2 days of surveying in St Ives Bay that they have described as constituting a baseline survey. Given the huge seasonality in habitats and species in the bay, a much lengthier and more thoroughly robust and extensive temporal baseline is a bare minimum for future effects to be detectable.

Existing peer reviewed papers support our concerns and those of the UN that the technology is unproven with unknown risks:

- 'Nanoscale solid waste that can be harmful to the environment' (Lui et al., 2020. Research progress in the environmental application of magnesium hydroxide nanomaterials) is directly applicable to the principles of the PT proposal. This is of particular concern to seals who are benthic feeders that could ingest toxins settled on the seabed around their prey
- 'Overall, the side effects of OAE on organisms, and more importantly on ecosystems, is largely unknown and deserves research at the experimental level to provide a better knowledge in order to make informed decisions on whether or not alkalinity enhancement is a feasible mitigation strategy'. (Hartmann et al., 2023 Stability of alkalinity in ocean alkalinity enhancement (OAE) approaches – consequences for durability of CO2 storage.)

SRT welcome the opportunity to work with all relevant stakeholders including the UN to ensure that serious and essential work is actioned to limit climate change to 1.5 degrees, but not to the detriment of vital ecosystems and the vulnerable, economically disadvantaged populations that depend on them.

PT have relied heavily on computational modelling to predict the chemical flux, however this methodology is questionable. Firstly, whilst computational models are becoming more sophisticated through the use of machine learning, their use is not sufficiently robust to determine the efficacy of the proposed CDR techniques alone. A recent

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comprehensive review of multiple CDR models highlighted that ‘conclusions might not be generalizable to the entire chemistry of a material class’ (Rahimi et al., 2021 Toward smart carbon capture with machine learning). PT have not disclosed what modelling systems have been used, but no modelling system can singly account for all unique variations in the marine environment. The modelling system has been used as a proxy for *in vitro* experimentation, with the sole sample analysis being conducted on a single sample of the Hayle South West Water effluent. The lack of replication is flawed as it fails to account for seasonal fluxes in both biological and abiotic factors; such as temperature, pH, presence of contaminants from seasonal variations in flooded mine outflows, fishing, water use and transport fuel in the local area. A model using a single sample for its data collection is not a sufficiently robust predictor of efficiency.

Additionally, the only chemical analysis on this sample reported was as follows: ‘A titration with saturated MH solution was also performed which demonstrated the reduction in CO₂ partial pressure in the effluent with increasing alkalinity addition’ (Planetary Hydrogen Phase 1 Final Report, 2022). Again, this fails to acknowledge the effect of seasonal fluxes in chemical parameters and does not account for any off target effects of the addition of MH. In fact, there is no chemical analysis to corroborate that PT’s theoretical stoichiometry, whilst grounded in oceanographic literature, can be applied to the specific environment of St Ives Bay.

Given this high level of uncertainty about OAE as being safe or even feasible, the ‘precautionary principle’ must be applied to this and similar projects, which should only be licenced once a lot more is known about the industry, before any part of the marine environment is put at risk, let alone a bay that is fundamentally vital to our region’s economy.

SRT’s key asks of the PT project:

- A substantial delay in licencing this project until more is understood about OAE and its impacts specifically in St Ives Bay. At the time of writing the EA have not yet issued a licence for any further MH releases.
- The completion of the EA’s independent and industry standard Environmental Impact Assessment
- Peer reviewed publication of PT’s commissioned scientific research into the impact on plankton and oyster larvae
- More research into the impacts of OAE on other marine species at all levels of the ecosystem
- A thorough Public Consultation run by a statutory agency, such as the EA, to ensure the full spectrum of stakeholder inclusion.
- a greater carbon budget than currently proposed (40% is inadequate given the wider environmental impacts of MH mining processes that were not included in the calculations).
- Greater reassurance that realistic scaling up of this project is actually possible, given MH costs and availability in order to contribute, albeit in a small way, to global CDR.
- PT’s CDR Scheme credits only be made available to companies who have already demonstrated significant carbon emission budget reductions. It is vital companies reduce emissions first and continue to be incentivised to do so. OAE approaches should only be used by companies as a last resort option once other actions towards carbon neutrality have been exhausted, not as a first port of call to demonstrate a company’s green credentials.

It seems PT began by communicating their plans to politicians and received a UK government grant for £250,000, won a £1 million prize from Elon Musk, as well as having sold carbon credits to Shopify and Stripe (the CEO is personal friends with PT’s CEO). The local community were the last stakeholders to be consulted and in a very cursory fashion. Whilst PT have held meetings with Cornwall County Council and town councils, our collaborative team effort has not yet been heard in any formal way. All we have been able to do is to write letters to the EA, politicians and other statutory agencies such as Defra, the Joint Nature Conservation Council, the Marine Management Organisation and Natural England. There is a huge imbalance between private enterprise with big business support and finance buying into CDR and offsetting and community groups and charities such as ourselves concerned about the conserving their local economy, environment and societal benefits when faced with CDR, OAE and Geoengineering Schemes.

Many thanks for your time. No doubt you already have all of these ideas covered, but we can sleep easier in the knowledge that we have shared our thoughts about what would have helped us avoid such a steep learning curve, and so other communities can ‘hit the ground running’ and actually have a ‘voice’ that is heard when similar projects are planned in their local area.



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