



PA/05908/23 & EA/00007/18

**PROPOSED CONVERSION FROM A
TEMPORARY TO A PERMANENT TUNA
FARMING AREA AS ESTABLISHED IN
PA/02175/18; RETAINING THE APPROVED
TOTAL BIOMASS OF FISH AND ALL
RELATIVE CONDITIONS**

**ENVIRONMENTAL IMPACT ASSESSMENT
UPDATE REPORT**

NON TECHNICAL SUMMARY

Version 1: March 2025



Report Reference:

Adi Associates Environmental Consultants Ltd, 2025. PA/05908/23 & EA/00007/18 - Proposed Conversion from a Temporary to a Permanent Tuna Farming Area as Established in PA/02175/18; retaining the approved total biomass of fish and all relative conditions – Non-technical Summary. San Gwann, March 2025; ii + 19 pp.

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Quality Assurance

PA/05908/23 & EA/00007/18

Proposed Conversion from a Temporary to a Permanent Tuna Farming Area as Established in PA/02175/18; retaining the approved total biomass of fish and all relative conditions

Non-Technical Summary to EIA Report

Report for: **Department of Fisheries & Aquaculture**

Revision Schedule

Rev	Date	Details	Written by:	Checked by:	Approved by:
00	Mar 2025	Submission to ERA	Adrian Mallia Managing Director	Eilis McCullough Senior Planning Consultant	Rachel Xuereb Director

File ref: G:_Active Projects\EIA\AJD010 - AJD Tuna extended farm EIA\EIA Report\FINAL CHAPTERS\NTS English_Final.docx



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INTRODUCTION

1. This Environmental Impact Assessment (EIA) Update Report was commissioned by the Department of Fisheries & Aquaculture (DFA) to support the proposal to convert the tuna farming facility approved under PA/02175/18 from a temporary to a permanent one as described in development permit application PA/05908/23. It describes an update to the EIA originally commissioned by AJD Tuna Ltd for their application for the temporary tuna farming facility at the same site. AJD Tuna Ltd are the operators of the tuna farm subject of the current application. The applicant is the DFA.
2. As explained by the project architect, the Scheme as proposed in development permit application PA/05908/23 is identical to that approved in PA/02175/18 in terms of the location of the Scheme, the number of cages / amounts of biomass to be reared, and the number, type, and area of moorings for the cages deployed. The only difference is that instead of a temporary facility that would move to a further offshore location once the North Aquaculture Zone (NAZ) is established, it will become a permanent one at this same location such that the impacts assessed as “short-term and/or temporary (for as long as the fish farm is in operation)”, will now become permanent and long-term.
3. Hereafter in this EIA Update Report, the proposed

development is referred to as ‘the Scheme’. A detailed description of the Scheme is provided in **Chapter 2** of the EIA Update Report.

Purpose of the EIA Update Report

4. The purpose of this EIA Update Report is to present the findings of the EIA. EIA is the process of systematically assessing the likely significant environmental impacts of development proposals. EIA also ensures that the significance of these impacts, and the scope for reducing them, is clearly understood by the public, and by ERA and the Planning Authority (PA) before a decision is made on whether or not the development should be approved.

Background to the Scheme

5. An EIA was first prepared in July 2018 on behalf of AJD Tuna Limited to support application PA/02175/18, which proposed the consolidation of two tuna farming operations that had already been approved under two separate applications (PA/03072/17 and PA/05858/17). The original scheme site was located at 5 km offshore and had a total biomass of 3,300 tonnes. This development came about following a decision by the Planning Authority to revoke all permits for all tuna farms in Maltese waters in September 2016 and ordering all farms to relocate to approved aquaculture zones by May 2017.
6. The ERA had requested an EIA as the proposal fell under Schedule I, Category I, Section 8.2.1.1 of the

Environmental Impact Assessment Regulations, 2017 (S.L. 549.46).

7. The permit was approved in May 2019 and covered the consolidation of the former AJD Tuna Ltd and MML tuna farms relocated from St Paul's Bay and the South Comino Channel, respectively, in one area approximately 5 km offshore. The biomass reared did not increase and covered the cumulative biomass allowed to be reared in the two farms mentioned. **Figure 1** shows the location of the two original farms in Comino and St Paul's Bay, their temporary relocation site 5 km offshore and the final approved consolidated area, subject of application PA/02175/18 and of the current proposal for conversion to a permanent facility. **Figure 2** shows the location of the Scheme site with distances from shore.
8. In addition to this application, whose location was deemed to be only a temporary solution, a second application, this time by the Department of Fisheries and Aquaculture (PA/04811/19) was submitted for the establishment of a North Aquaculture Zone (NAZ) to complement that already set up in the south of the island, approximately 6.3 km off Marsaskala in 2006. The application proposed to relocate tuna farms in the north of Malta for a total biomass of approximately 5,000 tonnes of fish. The application for the NAZ was itself the subject of an EIA process. The application is still awaiting a decision, and the process is currently on hold in view of a re-evaluation by the DFA of the country's aquaculture strategy for the future, which is likely to include a diversification away from tuna farming.
9. As explained, the Scheme as proposed is identical to that approved in PA/02175/18. In assessing the application, the ERA requested a statement from the original EIA Coordinator outlining whether the proposed change will affect the conclusions of the EIA undertaken for PA/02175/18.
10. On 31 January 2024, Adi Associates, as EIA Coordinators of the original EIA Report for PA/02175/18, submitted a statement to ERA, which concluded that while individually the impacts are not expected to differ from those assessed in the original EIA, impacts assessed as being short term or temporary could become long-term and/or permanent. This could, in the long run, lead to chronic effects on the environmental resources impacted. In addition, it was noted that detailed consideration should be given to the fate of the proposed NAZ and its pending development permit application (PA/04811/19), since the cumulative effects from the Scheme and the NAZ could further exacerbate the negative impacts.
11. Subsequently, ERA requested further studies and the submission of an EIA update report.

EIA Approach

12. The EIA Coordinator discussed the requirement for the new studies with ERA and, in view of the existence of regular marine monitoring reports undertaken at the site in connection with the tuna facility's environmental monitoring programme, it was agreed that these data could be used to assess the actual impact from the facility against the predicted impact in the EIA.
13. As agreed, this EIA Update Report assesses the impacts of the Scheme on the seabed and the benthic habitats, impacts on water quality, and effects on the Natura 2000 site conservation objectives, including impacts on seabirds.

Significance of Impacts

14. Assessment of the significance of impacts arising from the Scheme is a key stage in the EIA process. This judgement is critical in informing the decision-making process. However, defining significance can be difficult. In general terms, environmental significance involves assessing the amount of change to the environment perceived to be acceptable to the community (Sippe, 1999).
15. The following criteria were used in the EIA to assess the significance of an impact:
 - type of impact (adverse / beneficial);
 - extent and magnitude of impact;

- direct or indirect impact;
- duration of impact (short term / long term; permanent / temporary);
- comparison with legal requirements, policies and standards;
- sensitivity of receptor (residential dwellings, hotel, recreational areas, etc.);
- probability of impact occurring (certain, likely, uncertain, unlikely, remote);
- reversibility of impact;
- scope for mitigation / enhancement (very good, good, none); and
- residual impacts.

16. Using these criteria, the significance of the negative impacts arising from the Scheme was categorised, as follows:

- **not significant**, where the impact is environmentally acceptable;
- **minor significance**, where the impact is manageable; and
- **major significance**, where the impact is

environmentally damaging and requires redesign or mitigation measures to minimise it.

17. The EIA Report includes an assessment of the significance of predicted impacts and, following the implementation of any proposed mitigation measures, the significance of any residual impacts. A summary of the identified significant impacts and a comparison with those assessed in the original EIA of 2019 is included in **Chapter 5** of the EIA Update Report. The recommended mitigation measures, and residual impacts, are described in respect of each topic area, at the end of the relevant chapter (see **Chapters 3 and 4** of the EIA Update Report).

Uncertainty

18. The EIA process is designed to enable good decision-making based on the best possible information about the environmental implications of a proposed development. However, there will always be some uncertainty as to the exact scale and nature of the environmental impacts. This arises through shortcomings in information, doubts, or lack of certainty on the likelihood that an incidence will occur, and/or due to the limitations of the prediction process itself. Where uncertainties have arisen, and where they remain, this is clearly stated in the EIA Update Report.

Consultation

19. During the process of the EIA Update, consultation

meetings were organised with several stakeholders. These included: the St Paul's Bay, Mellieha, Għajnsielem, and Qala Local Councils, Transport Malta, the Malta Tourism Authority, the Armed Forces of Malta, Birdlife Malta, Moviment Graffiti and the Professional Diving Schools Association (PDSA). The feedback from these consultations is described in **Chapter 2** of the EIA Update Report.

Figure 1: Location of former farms off St Paul's Bay and South Comino Channel in relation to the temporary location 5 km offshore and the Scheme site

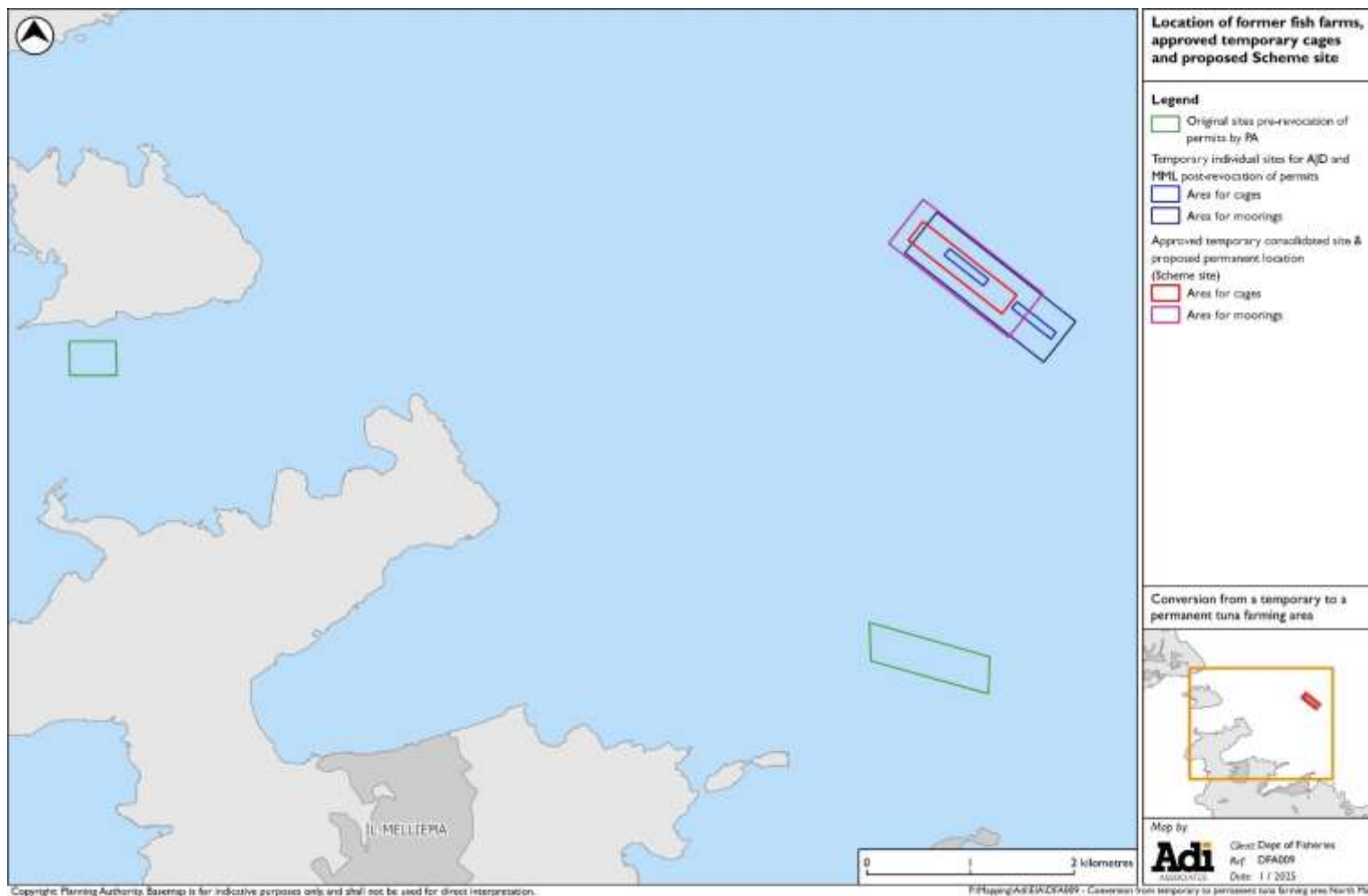
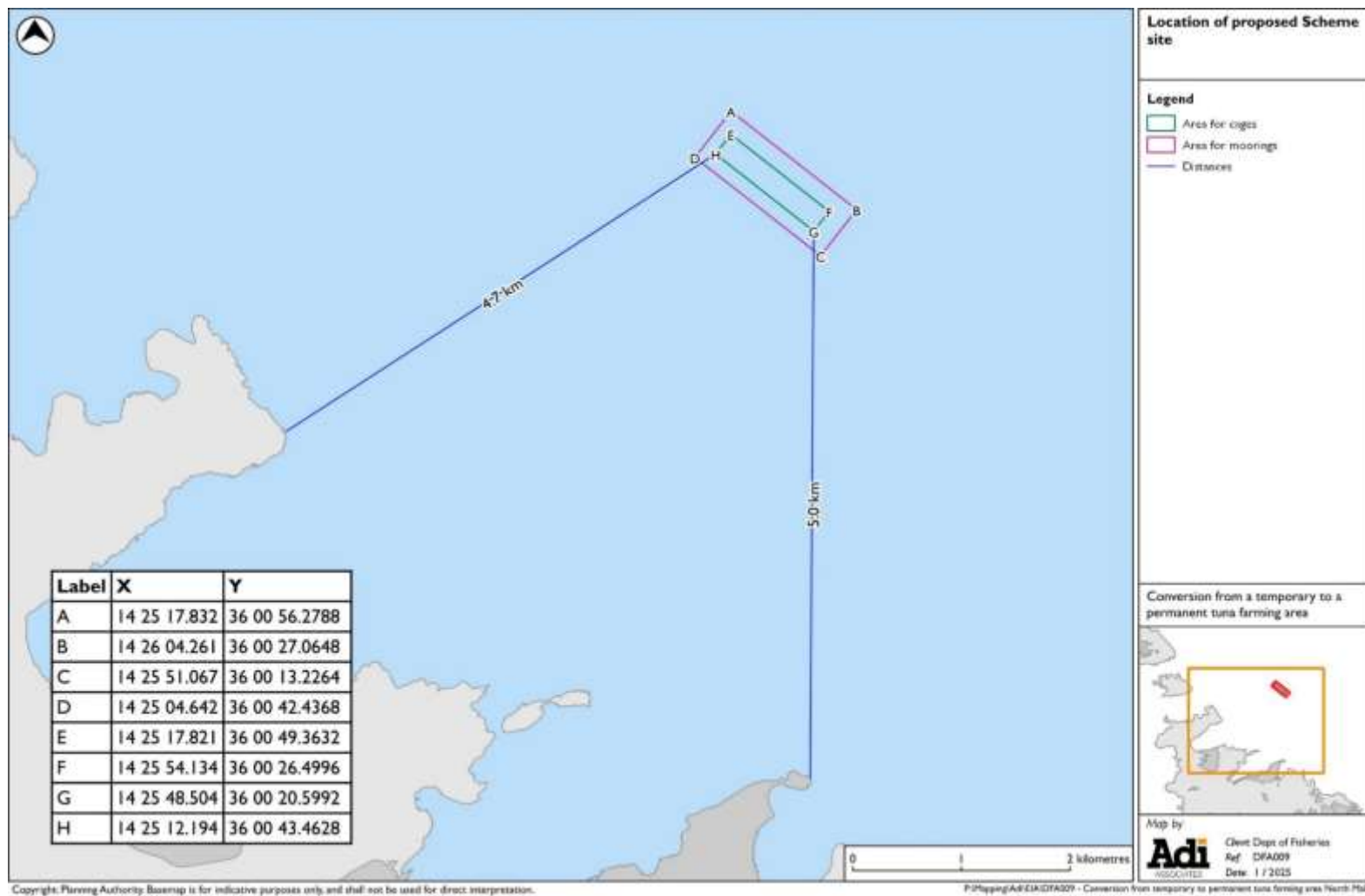


Figure 2: Scheme location and distance from shore



Assessment of Alternatives

Alternative Sites

20. Since the proposal for the Scheme is to retain the current site and operation and simply convert the operation from a temporary to a permanent one, no alternative sites have been considered for the Scheme. As mentioned, the North Aquaculture Zone (now referred to as Northeast Aquaculture Zone – NEAZ), which was originally intended to house the present operation, is now earmarked for a different form of aquaculture, focusing on other species and excluding bluefin tuna.

Zero Option (Do-nothing Scenario)

21. The Terms of Reference for EIA requires that the alternative assessment considers the zero option, or do-nothing scenario, which envisages there being no intervention in connection with the Scheme. Since the Scheme effectively proposes the continuation of the current operations at the same site indefinitely, two “do-nothing” scenarios can be considered: (i) not changing the status quo operationally, which is effectively the Scheme proposal; and (ii) not amending the policy direction, which would mean that the do-nothing scenario would entail the removal of the tuna farming operation from this site and its relocation elsewhere. This latter scenario would mean that the current site used by the Scheme would experience the elimination of impacts currently experienced from the farming operation and would likely

revert to a state that very much approximates the situation prior to the installation of the farm (assuming that the site is not used for some other operation). In this scenario and seeing that the tuna farming operation is a permitted operation but has a condition for relocation, would mean that any impacts from the aquaculture operation would simply be transferred to another site. The impacts of this relocation would depend on the characteristics and conditions of the relocation site, which, as explained, will no longer be the site originally identified for the setting up of the NAZ.

22. The “Do nothing” scenario which leaves the current operations unaltered, is the Scheme proposal itself. In this scenario, which is further assessed in the following chapters, the impacts identified in the original EIA, and which were considered to be temporary and reversible, could become permanent and potentially irreversible.

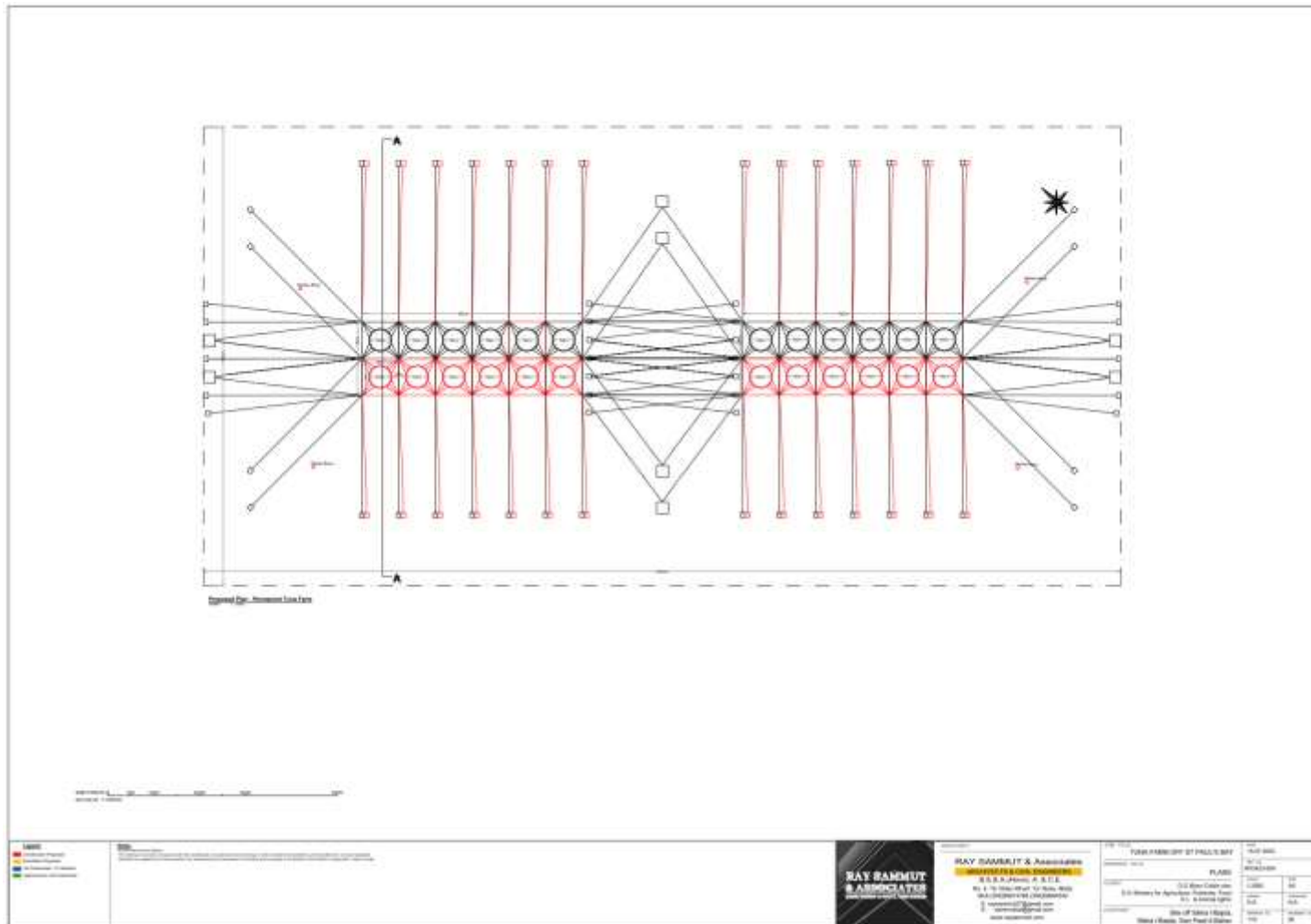
Alternative Layouts and Techniques

23. The Scheme’s retention at the site would not result in any change to the design or techniques used for its operation. The same moorings, mooring lines, cages etc, would be used for the permanent installation. The only change would be the shifting of some of the cages to be permanently outside of the Armed Forces of Malta firing arc.

DESCRIPTION OF SCHEME

24. **Figure 3** illustrates the proposed cage layout of the Scheme, which is the same as that of the current temporary operation. Each cage is a circular area with a diameter of 50 metres. The distance between the sides of the nets from the cages is 30 metres. The mesh size of the net is 70 x 70 mm and the twine diameter is 5 mm.
25. The Scheme will essentially operate in the same way as it currently does. The following lists the types of vessels used in the operations, all of which are registered with ICCAT, as per requirements:
 - Three feeding vessel (one also used to collect and transport offal);
 - Two service boats; and
 - One vessel for oil collection operations.
26. The Applicant's main client sends over the processing ship where the fish are transferred and processed following harvesting.

Figure 3: Cage layout



SCHEME OPERATION – THE TUNA PENNING PROCESS

Tuna capture and transfer to farm

27. Tuna are caught by purse seining on the high seas. This activity is allowed under ICCAT rules for a restricted time during the year as the fish are migrating through the Mediterranean Sea. There are no Maltese purse seiners and therefore the fish are caught by foreign vessels from whom the Applicant purchases stock.
28. The tuna caught in the purse seines normally range in size from 50 to 300 kg, with the vast majority of the fish being between 100 and 200 kg.
29. Once the tuna are caught in the purse seines and the required amounts are purchased, they are led through openings in the purse seine into the farm's towing cages. Once the cages are filled with the required stock, they are slowly towed to the on-growing site¹ where they are anchored in position to the mooring system that would have already been deployed at the site.

¹ Towing speeds rarely exceed 1 knot, with the transfer taking a number of weeks (depending on the distance between the catch area and the farm).

² At the start of tuna penning, this used to reach 3-4%. The amount of feed has since been reduced to 2%.

30. The entire operation is overseen by ICCAT international observers.

Penning

31. Once on the farm, the tuna are fed and fattened, largely a process of conditioning, through which the fat-to-protein ratio is adjusted through a high fat diet. The tuna are kept in the pens for between 3 and 7 months, after which they are harvested and sold to the Japanese market.

Feeding and feed management techniques

32. The tuna are fed small pelagic fish, usually, herring, mackerel, anchovy, sardines, etc. Approximately 2%² of the stock housed in the cage is provided as feed to the tuna. At the peak of the penning season, this equates to approximately 3,000 kg of baitfish/cage/day. It is estimated that it takes 10-25 kg of baitfish to produce 1 kg of tuna. A more recent study (Guillen et al., 2024³) puts this at approximately 10 kg (FCR = 11%).
33. The feed is ordered from a number of international suppliers and five reefer containers with feed arrive in

³ Guillen J, Asche F, Carvalho N, Druon J-N, Llorente I, Sciberras A, Visnic' Novakovic' S and Vukov I (2024) How sustainable is tuna aquaculture? A methodology to assess the sustainability of seafood production systems. Front. Aquac. 3:1422372

Malta on a daily basis; these are stored at the Freeport. Every day a number of containers (usually between 1 and 4, depending on the stock) are transferred to the Kordin land base facility operated by AJD Tuna Ltd. The fish are transferred from their transportation packing and placed in impermeable jumbo bags. The bags are then placed in sealed trucks, where they are allowed to partially thaw overnight.

34. Early the next day (around 4:00 am), the baitfish are transferred to the Grand Harbour where they are loaded onto a feeder vessel. Once loaded, the vessel sets sail towards the farm.
35. The tuna are fed once a day, at dawn. Semi-frozen baitfish are normally placed in small feeding cages floated at the centre of the pen, and once they have been thawed enough, the central cage is opened by divers and the fish dispensed into the pen. The divers monitor the tuna and control the amount of feed released into the pen to minimise wastage. Once the tuna are satiated, the diver stops feeding. The process may be repeated two hours later; however, if the tuna are satiated, any remaining fish can be lifted from the pen and transferred to other cages.
36. In order to optimise feeding efficiency it is necessary to ensure that when fed to the tuna the baitfish are not completely defrosted so that the high calorific oils are ingested too and not lost from the feed. Nonetheless, the process does involve the development of an oily slick

originating from the semi-frozen feed. In order to address this issue, a number of measures have been taken throughout the past years. These include:

- The baitfish is being imported as IQF, i.e. "individually quick frozen." IQF foods are notable for the fact that each individual piece of food is frozen separately from all the others. In this case, rather than a block of frozen fish (as used to be the case in the past years, each baitfish is now individually frozen and delivered as a separate fish. They are also typically in a semi-frozen state, which minimise the production of oils in thaw water;
- The baitfish is retained in the impermeable jumbo bags in the sealed trucks while transported from the land base in Kordin to the farm to contain the thaw water;
- The jumbo bags are delivered to the farm onboard feeder vessels. These vessels are bunded / sealed so that the thaw water from the bags is contained onboard. The vessels are certified by NAS. The thaw water is then collected from the feeder vessel by the oil containment vessels;
- An oil boom is permanently deployed inside each cage to contain any fish oils that may be released from the feed;

- When the baitfish are transferred to the fattening cages, they are transferred inside the impermeable jumbo bags referred to above and their contents emptied inside the cage when the tuna are ready to be fed. This would release both the baitfish and some of the thaw water inside the cages; however, the presence of the oil boom along the entire internal diameter of the cage contains much of the oil that rises to the surface inside the cages⁴;
- The oily material so released and contained in the cages is then collected from the surface of the sea inside the cages by means of a skimmer operated by divers inside the cages. The collected oil is stored in IBCs and transferred to land for onward transmission to a waste oil recycling company;
- The tuna farm operators also appointed Aquaculture Resources Ltd to deploy three oil containment vessels to patrol the seas between the

tuna penning locations to help contain and collect any oils that escape, including oils that may rise to the surface outside the cages themselves⁵.

37. These measures have been monitored as part of the implementation of the environmental permit of the current farm.

Harvesting and processing

38. Harvesting of fresh tuna is largely on demand, although the vast proportion of the tuna is today being harvested for the frozen fish market.
39. When harvesting occurs, the bottom of the net is raised to a degree, forcing the fish closer to the surface. Slaughtering is particularly delicate since the amount of stress the fish are subjected to must be kept low because if the fish are stressed their body temperature rises sharply, which would compromise the quality of the meat. Slaughtering is carried out by divers who enter the cage

⁴ This would depend on the state of the sea. Under calm conditions, the surface slick is mostly retained inside the cage; on the other hand, strong swell could result in overtopping of the oily slick outside of the cage containment. In this case, external oil spill containment / spill collection vessels would need to be deployed.

⁵ Unfortunately, as also confirmed by the Environment & Resources Authority (consultation meeting, December 2024), sometimes, the oils from the baitfish

are released in deeper water as the baitfish sink inside the cage. This oil often drifts out of the cage (possibly also as a result of the swimming frenzy of the tuna during the feeding) and the oil ends up surfacing some distance from the cages. In these circumstances, the oily sheen and the possible formation of oily slime might not be noticed in time for the patrolling vessels to intervene and collect it resulting in the slimy material drifting away from the farm under the action of currents and waves.

and harvest the tuna one by one by shooting them in the head.

40. The tuna are transferred to a service vessel by crane from where they are then quickly transported by service boats to a waiting processing vessel anchored further out at sea. Onboard the ship, the tuna are weighed, heads and tails are cut off and the guts removed. The head, tails and guts of the tuna, which amount to approximately 30% by weight, are a waste by-product of the industry. These used to be disposed of at sea beyond the 12 nautical mile limit as directed by the Veterinary and Phytosanitary Regulation Department. However, following the establishment of Aquaculture Resources Ltd by the Federation of Maltese Aquaculture Producers and the construction of a rendering plant in Hal Far, this waste by-product is being collected and transformed into valuable products, including protein-rich fish meal and Omega-3 and Omega-6 fish oils. These materials are essential for the cosmetic, pharmaceutical, and agricultural industries (Aquaculture Resources Ltd, 2024⁶). The operation typically generates approximately 8-10 tonnes of offal per day during the peak fattening period.

41. If the harvested fish are to be sold to the fresh fish

market, they are normally processed onboard the service boats (not the processing vessels / freezer ships) and at the land base facility in Marfa. In this case, processing has to take place in a short time interval in order to minimise the length of time that the fish remain at ambient temperatures. The fish are processed in the same manner as described above, except that rather than blast frozen, the fish are cooled in an ice and salt mixture to the desired temperature and packed in purposely designed carton boxes for export.

42. The fresh fish produce is air freighted to its final destination, whereas the fish intended for the frozen fish market are transferred to a reefer vessel or exported on the same factory vessel on which they were processed.

Post-harvest

43. Following harvesting, between November and May, the Applicant is allowed to keep up to 15% of the stock in the cages for research purposes. The fish so retained are fed between two and three times a week during this period.

⁶ Aquaculture Resources Ltd website. <https://aquacultureresources.com> (last accessed on 20 December 2024).

Waste Management

44. Wastes generated by the Scheme are likely to include:
- Packaging waste from importation of baitfish;
 - Thaw water from baitfish preparation;
 - Oily slick (from baitfish);
 - Uneaten feed;
 - Fish excreta;
 - Dead tuna;
 - Blood (during slaughtering);
 - Wastewater from onboard processing of fish (mixture of blood, water, and offal);
 - Offal (gutted heads, tails, and internal organs);
 - Algal and other net fouling marine growth; and
 - Marine litter.
45. Details on each waste stream and measures employed for its management are provided in the EIA Update Report.

Employment

46. The tuna farm operator currently employs 55 full-timers

and 40 part-timers. Employees include divers, boatmen, handymen, and drivers. This will not change.

SIGNIFICANT ENVIRONMENTAL IMPACTS AND MITIGATION

47. The EIA Update Report provides a re-assessment of the impacts considered in the original EIA undertaken for PA/02175/18 in the light of the findings of the environmental monitoring undertaken at the Scheme site since 2019. It also considers the effects on the Conservation Objectives of the Natura 2000 sites. Conclusions and recommendations, especially with regards to mitigation measures are also provided.
48. As requested by the ERA, the analysis was restricted to the impacts on seabed habitats from fish waste and uneaten feed, impacts on water quality from nutrient loads and other pollutants, consideration of the extent of the area affected by the operations and its recovery potential, and effects on the conservation objectives of Natura 2000 marine sites.
49. In the EIA Report for PA/02175/18, the unmitigated major impacts identified related solely to benthic ecology, arising from the placing of mooring blocks on the seabed and changes to benthic habitats containing live rhodoliths from shading effects by the cages.
50. Other impacts were identified as being of possible major

significance under certain circumstances, though a degree of uncertainty or a range of possible conditions did not allow the impact to be conclusively defined at the time. These include:

- Water Quality impacts:
 - Deterioration in water quality from increased nutrient loads from uneaten feed;
 - Operational discharges of oil and bilge waters from maritime traffic associated with the Scheme;
 - Discharge of sewage from processing vessels;
 - Marine pollution from ship litter;
 - Impacts on Marine Ecology:
 - Loss of habitats through settlement of uneaten feed.
51. Other uncertain effects related to impacts on birds (disturbance from light pollution, predation on seabirds, and impacts from ingestion of marine debris), marine archaeology (potential damage to unknown or buried artefacts), and effects on humans (including impact on the AFM's firing practice area, impacts on navigation, deterioration of inshore waters and impacts on recreation and tourism).

Predicted vs Actual Impacts

52. The EIA Update Report assessed whether the impacts of potential major significance identified in the original EIA Report actually did materialise following five years of tuna penning activity, in the light of the findings from the ongoing environmental monitoring at the Scheme site.

Benthic Ecology

53. **Original EIA:** The impact on benthic habitats from the placement of moorings was considered to be of major negative significance for those sessile fauna and flora located beneath the mooring blocks. This is more so for those blocks located in areas with increased cover of live rhodoliths. **EIA Update:** This impact was confirmed in the Update Report.
54. **Original EIA:** Benthic habitats are also affected by the uneaten feed settling on the seabed. This impact could be major for the area of seabed directly beneath the cages but reduces to not significant with distance from the cages. The extent of this impact depends on the effectiveness of feed management and the amount of feed actually lost / uneaten. Good feed management can significantly reduce this effect. **EIA Update:** The findings of the environmental monitoring of the seabed over the five-year period 2019-2023 indicate that while the tuna penning activities have resulted in some alterations to the physical and biological characteristics of the seabed, the

impact overall from fish wastes, uneaten feed fish, and tuna carcasses, is deemed to be minor to not significant as long as good farm management practices are in place. These alterations are not large and are reversible.

Water Quality

55. **Original EIA:** It is considered that the Scheme may have a major negative impact on marine water quality from increased nutrient loading resulting from uneaten feed settling on the seabed, operational discharges of oil and bilge waters, discharge of sewage from marine vessels, and discharge of marine litter or loss of anthropogenic items overboard. **EIA Update:** The water quality and sediment monitoring results have not indicated any such deterioration. Values of the monitored attributes were generally within a range that would be expected of local offshore waters, and no appreciable differences in values were noted amongst the four sampling stations. The tuna farming operations have not resulted in appreciable alteration in water quality.
56. **Original EIA:** Most of these impacts are either uncertain or can vary depending on a number of factors. Impacts from uneaten feed will depend on the amount of such material settling on the seabed, with the impact likely to be higher directly under the cages and reducing in extent with distance from the cages. Impacts from oil or bilge losses depend on the amount of pollutant lost; likewise, the impacts from sewage, which will also depend on the

maintenance of available containment or treatment measures on board (e.g. holding tanks or sewage treatment plant). The impact from marine litter can be severe, both on avifauna and on benthic species. Evidence of considerable amount of anthropogenic material at and near tuna farms has been recorded in past monitoring reports. Effective action to minimise such accidental losses or deliberate discharges are required to mitigate this impact. **EIA Update:** The limited impacts identified are a strong indicator of the importance of good farm management practices. No instances of bilge water or sewage discharges have been reported to date. The loss of anthropogenic material and other litter on the seabed seems to be on the increase with little of this material being retrieved (unlike tuna carcasses, which have often been collected for disposal on land). Impact deemed not significant with regards to sewage, bilge waters, oil spills and of minor to major significance with regards to anthropogenic litter.

Avifauna

57. **Original EIA:** The Scheme has the potential to create impacts of major significance on the breeding seabird populations. Impacts can result from increased light pollution, predation effects from gulls attracted to the farm, and ingestion of marine debris. All these impacts depend on the extent of intervention, e.g. number of lights and intensity thereof applied to cages, or amount of marine litter lost; the impact from gull predation depends

on whether the gull population does increase as a result of the Scheme, and whether the gulls actually do attack the other seabirds or compete with them for food and nesting sites. **EIA Update:** Uncertainty remains. While light pollution does not appear to be a major consideration with regards to the farms, Birdlife Malta reports that the number of seabirds frequenting fish farms (including the ones in the south) seems to be increasing, with fish farms being a favourite destination for bird watchers (especially for terns, gulls and petrels). Reports of instances of seabirds oiled with fish slime are also increasing.

Archaeology

58. **Original EIA:** The Scheme could impact archaeology either through direct impact of the identified target or through exposure of as yet unknown buried artefacts. The impact is unlikely for the former since the target is known and hence can be avoided, and uncertain for the latter since it depends on the presence or otherwise of such artefacts. **EIA Update:** No effects on archaeology have been reported over the past years and the likelihood of buried items being disturbed is low.

Effects on Human Populations

59. The effects on humans and their activities can be split into two types: effects from the presence of the Scheme and effects from the discharge of fish oils and slime.
60. **Original EIA:** The presence of the Scheme can affect the

AFM firing practice area and may also impact navigational safety. The impact on the AFM range will only be major if the Scheme remains in its current location. The fact that the current application subject of this EIA has been changed to shift the farm completely out of the firing arc and maintain a buffer area in between should mitigate this impact. As regards navigational safety, this can be mitigated though normal navigational safety practices, including proper charting and on site marking of the farm.

EIA Update: It has since transpired that the farm was not actually shifted and hence the issue remains. The AFM is still objecting to the location of the farm and insisting that it should move outside of the firing arc. The DFA has issued written instructions to the farm operator to shift the farm to its permitted location by 31 March 2025. As for navigational safety, the situation remains the same. The farm has been charted, and no additional navigational issues are reported. Transport Malta has maintained its no objection to the Scheme subject to adherence to conditions.

61. **Original EIA:** The unmitigated discharge of fish oils and slime can affect inshore waters, as has been registered in recent years. This would impact bathing, yachting, diving, and related recreation, tourism, and the general quality of life of coastal residents and visitors. The significance of the impact will depend on the amount of fish oil released into the marine environment during feeding and the amount of oils that escape the farm and the collection

systems deployed to counteract this issue. **EIA Update:** The release of fish oils remains a problem for as long as the tuna are fed feed fish. The deployment of additional patrolling and oil collection measures are a positive step and increased surveillance is important. The possibility of using other technologies to develop an early warning system should be considered further. As should the possibility of changing the feed to the new artificial feed being developed specifically for tuna. Impacts confirmed.

Conclusions

62. Evidence from the environmental monitoring programme undertaken over the past years show that as long as the management of the farm and the monitoring of the feed follow good operational practices, the impacts on the seabed and on the water quality are contained and the residual impact is less than what was originally predicted.
63. Although surveillance and oil collection measures have been stepped up, the impacts from fish slime when this manages to escape the farm precincts and reaches the inshore areas, is still of major significance especially with regards to nuisance on other marine and coastal uses. Greater attention to this issue must be had, for as long as the tuna keep on being fed bait fish.
64. The availability on the market of artificial feed specifically designed for bluefin tuna could be a game changer and local tuna farmers are encouraged to explore this new

product with a view to eliminate or reduce baitfish feeding.

65. Except for the above, the rest of the impacts are not individually expected to differ from those assessed as a result of the Scheme proposal to convert the current temporary tuna farm operation into a permanent installation, except that they would no longer be short term or temporary but become long-term and/or permanent, which could, in the long run, lead to chronic effects on environmental resources. This situation should, therefore, be continually monitored to counteract any sudden or unanticipated effects. The following recommendations are also to be considered as eventual permit conditions if the proposal is approved.

Recommendations

66. While impacts from the tuna penning activities on the marine environment appear to be contained, certain measures can still be taken to mitigate or minimise further these effects. Such measures include:
 - Ensuring that as long as the tuna continue to be fed baitfish, the feeding is carefully monitored and feeding stopped as soon as the fish appear satiated so as to avoid the loss of uneaten fish and its deposition on the seabed beneath the cages;
 - The tuna farm operator should consider testing the

new artificial feed that has been developed specifically for tuna with a view to assess its suitability and financial feasibility in the hope that this could be a game changer that would eliminate the possibility of uneaten feed fish ending up on the seabed. It would be advisable for the farm operator to be requested to provide a report on viability of this (or similar) feed;

- Issuing strict instructions to farm operations against discarding of material into the marine environment. In the eventuality that anthropogenic items end up on the seabed by accident, every attempt should be made to retrieve and dispose of them in an appropriate manner (given the water depth of around 50 m this should be possible). ERA should also consider imposing fines if the monitoring reports report an increase in such items, as has been happening recently;
- Avoiding having tuna carcasses or the remains of dead tuna ending up on the seabed below the cages and in their vicinity, even if this is not the direct result of action by the tuna farm operators; in this respect tuna carcasses and / or remains of dead tuna should be retrieved by divers (given the depths), as long as these have not started to decompose;

- Undertake a consolidated study to assess the effects of the fish farms on the seabird populations in the Maltese Islands and including: the farms as a source of food, impacts from fish slime oiling, impacts from marine litter, and predator-prey interactions;
- The patrolling of the shores and collection of fish slime and oils is to be improved to eliminate the possibility of this material reaching the inshore areas;
- Explore the possibility of using technology to establish an early warning surveillance system for oil slicks and fish slime; and
- Tuna farms to be encouraged to properly implement the environmental management systems they devised as part of their environmental permits and to regularly train their staff on environmental matters. Annual audits of the EMS should be considered to ensure implementation.