Department for Energy Security & Net Zero

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Department for Energy Security & Net Zero

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Dear [redacted]

THE OFFSHORE OIL AND GAS EXPLORATION, PRODUCTION, UNLOADING AND STORAGE (ENVIRONMENTAL IMPACT ASSESSMENT) REGULATIONS 2020

NOTICE UNDER REGULATION 12(1)

BUCHAN REDEVELOPMENT PROJECT

The Offshore Petroleum Regulator for Environment and Decommissioning ("OPRED") acting on behalf of the Secretary of State for Energy Security and Net Zero ("the Secretary of State") is currently considering the Environmental Statement ("ES") and the representations received from the public consultation process in relation to the above project. NEO Energy (ZEX) Limited is hereby required to provide further information in relation to the following:

1. Section 2.3.2.1 - Buchan Redevelopment Concept Design - Alternatives - It is stated that' Shuttle tanker emissions were found to result in less emissions principally due to the relatively high-power requirements of the FPSO crude oil pipeline export pumps compared to pumps used for cargo offloading to an FPSO.' Please provide evidence of the work undertaken to support this statement.

2. Section 3.2.1.3 - Greenhouse Gas (GHG) Emissions During Operations - This section discusses the increased power requirements for the Normally Unattended Installation (NUI) tie back to existing host installations and it is stated that the Buchan Redevelopment Project would be responsible for a proportional percentage of emissions relative to the host installations forecast throughput. However, it is unclear if the percentage contribution is based on total fluids at the host installations or only hydrocarbon production. Please clarify. Where the percentage contribution is for hydrocarbon production only, please demonstrate why this is considered an acceptable method rather than

total fluids, noting that the host installation will likely have a very high water cut.

3. Table 3-8 - Indicative Well Design - Differences between ES and FDP - i) The section lengths specified in this table do not appear to align with those in Figure 42 of the draft FDP. ii) section 3.2.6.2 of the draft FDP makes provision for an alternative case of an 8.5" open hole reservoir section. Please clarify what effect if any these apparent differences would have on cuttings modelling and impact conclusions.

4. Section 3.5.6 - Cementing Chemicals - This section states ' It is estimated that c. 20 te of cement could be discharged on the seabed each well location.'. Please clarify if this includes any planned pumping excess e.g. 300% / 100% excess for tophole sections. If this is planned and not accounted for, please clarify the associated area of impact.

5. Table 3-13 - Subsea infrastructure to be installed - i) For all infrastructure please clarify if the design of the various items means they can be removed at time of decommissioning including cutting of any piles 3m below seabed. ii) Reference is made to an EHC umbilical to be installed. Please clarify if any chemical injection umbilicals will be installed and if so, they area of impact associated with these.

6. Section 3.6.4 - Gas Export Flowline - This section states that spot rock cover could be required for up to 25% of the line length. Noting that the infield flowlines have a worst case 100% rock cover applied, please clarify why this same approach has not been taken for the gas export flowline i.e., why is there a difference in potential rock cover? If there is any update to the rock cover, the impact needs to be assessed including within Table 9-1.

7. Table 3-14 - Anticipated stabilisation and protection requirements - Please clarify how the mass of rock required for cover of the infield and gas export lines have been calculated e.g., will infield lines be covered by a single rock berm or individual, what are the dimensions for the rock berms etc.

8. Section 3.7.3.1 - Process and Utility Systems - It is noted that a mercury removal unit is included in the topsides process facilities. There is no other mention of mercury in the ES. Please clarify if mercury removal will be necessary and if so, how the wastes will be disposed of.

9. Section 3.7.4 - FPSO Modifications before Deployment - The second bullet point in this section states 'Produced water system modifications to permit produced water injection (primary disposal route) as well as overboard dumping (secondary disposal route in upset conditions);'. Please confirm that discharge of produced water will only take place during periods where PWRI is unavailable. Please note it is expected that out of specification produced water would be diverted to e.g. slops tanks for later re-processing rather than discharged overboard during upset conditions.

10. Section 3.7.4.3 - Modifications to the Water Injection System - Please clarify whether energy efficiency measures and power load demand have been considered when modifying process plant.

11. Section 3.8.3 - Produced Water Re-injection - It is noted that a maximum discharge concentration for oil in produced water has been stated as 30mg/l and it is understood that NEO are referring to the monthly average oil in water concentration rather than an instantaneous maximum. However, the Western Isles FPSO currently has a permitted discharge limit of 25mg/l and as per pre-ES submission discussion with OPRED it is likely that a limit of <30mg/l monthly average oil in water will be applied. The forecast information provided in any subsequent OPPC permit application will help establish what the permitted level would be for the re-development. OPRED will review all the information provided at the application stage, but we would be inclined to permit <30mg/l based on previous performance. The permit will be reviewed on an annual basis against actual operational limits and discussions will be held with NEO if the Department decides to reduce the permitted level further towards the target 15mg/l. Please confirm that NEO understand it is unlikely a 30mg/l oil in water concentration will be applied in this case.

12. Section 3.9.1 - Pipeline and Subsea Infrastructure - This section states 'In line with current guidelines and legislation the decommissioning of the subsea flowlines and EHC umbilical would be subject to a Comparative Assessment and Decommissioning Programme.' NEO should note that any proposals to install pipeline bundles post 2011 must include a commitment that these are designed for full removal at the end of their operational life. Please confirm that this is understood.

13. Table 4-2 - Summary description of the different environmental surveys identified in Figure 4-1 - i) Regarding the Benthic Solutions Ltd 2021 survey, please clarify if metals levels would be expected to cause environmental impacts. ii) a) Regarding the Benthic Solutions Ltd 2019a survey, please clarify if the heavy metals levels exceeded the OSPAR approximate environmental effects threshold (50ppm). b) Please provide further information on the metals which exceeded ERL values and the stations proximity to proposed infrastructure, where necessary including an impact assessment.

14. Section 4.2.3 - Wind and Waves - The last sentence in this section is incomplete. Please clarify.

15. Section 4.2.5.1 - Particle Size Distribution - This section states ' A small number of samples showed had percentage sands ranging from c. 68 % to 76 % which were thought to be associated with the discharged cuttings from the upper sections of the historic wells.' Please clarify if the stations were located close to infrastructure to support this suggestion as varying sediment types are shown in Figure 4.7. Additionally, please clarify if shell material was removed prior to PSD analysis being undertaken as the shell material described earlier in the paragraph will influence mean particle size and sediment composition.

16. Section 4.2.5.2 - Total Hydrocarbon Concentrations (THCs) - This section states ' Higher THC concentrations (ranging from 5.59 mg.kg-1 to 407 mg.kg-1) were recorded in a few samples taken however it should be noted that the THC concentrations exceeded the UKOOA 95th percentile in only two samples.'. i) Please clarify which survey these samples were taken from. ii) Information on the stations which exceeded the 95th percentile (i.e. proximity to infrastructure) would be beneficial in assessing the extent of hydrocarbon contamination. Clarity on whether both stations exceeded the OSPAR 50 ppm approximate ecological effects threshold should be provided.

17. Section 4.2.5.2 - Polycyclic Aromatic Hydrocarbons (PAHs) - i) Please clarify why comparison to US EPA and NOAA thresholds was undertaken rather than OSPAR ERL threshold values. Please provide comparison to OSPAR ERL thresholds for PAHs. ii) The Cefas report referred to isn't provided in the reference list; please provide details. iii) Please clarify whether the pipeline survey stations referred to were above or below the range of values recorded by Cefas.

18. Section 4.2.5 - Seabed Sediments – There is no information on the concentrations of metals in sediment, but they are mentioned in Table 4.2. Please provide comparison to appropriate OSPAR threshold values.

19. Figure 4-8 - Location of historic cuttings piles relative to location of proposed Project infrastructure - i) The water depth in the key doesn't correlate to the expected depth in the region. Please clarify. ii) Plotting the extent of the cuttings pile and 50 ppm footprint in this figure would be beneficial to identify whether any disturbance of sediment with elevated hydrocarbon levels is likely to occur. Please update figure as necessary.

20. Section 4.2.5.3 - Existing Cuttings Piles - i) Please clarify how the cuttings pile extent was determined. ii) Please clarify how the oil content within the five well pile was determined.

21. Table 4-3 - Characteristics of the existing cuttings piles in the vicinity of the proposed Project - i) The cuttings area footprint is stated as 3,371m2 and seems small given the pile measures 550 m x 200 m. Please clarify. ii) Please clarify how the areal extent of the 50 ppm footprint was determined.

22. Figure 4-10 - Seabed photographs in vicinity of proposed project - Please clarify what the grey line represents as there is no boundary between sediment type evident.

23. Section 4.3.2.2 - i) This section is titled benthic communities but there no discussion of the macrofaunal community within the Buchan field other than the sentence discussing Arctica islandica. Please provide information detailing the macrofaunal community present in the environmental surveys detailed in Table 4-1. ii) The last paragraph in this section appears to contradict the second last paragraph with respect to the presence of live specimens of A. Islandica. Please clarify.

24. Figures 4-14 and 4-15 - Nursery and spawning grounds - The titles of these figures refer to different blocks than the project location and the figures themselves do not appear to show the correct location of the project. Please provide updated figures.

25. Figure 4-19 - Commercial Fisheries - Please clarify rationale for using fishing data from 2010 to 2020. The most recent data in EMODnet is for the period 2018-2021.

26. Figure 4-20 - Shipping - Please clarify the rationale for using shipping density from OGA, 2016. More recent vessel density information is available on EMODnet (2017-2022).

27. Section 7 - Emissions to Air - While noting that electrification is outside the project scope, this section states 'Electrification from INTOG developments will not only result in a reduction in direct emissions from the Western Isles FPSO, but also provide an increase in renewable generation capacity for the UK grid, assisting in the UK Government's Net Zero target.'. it is unclear how electrification of the Western Isles FPSO will result in an increase in renewable generation capacity. If it is to do with the commercialisation of the windfarm going ahead, this should be made clearer. Please clarify.

28. Section 7.1 - Emissions to Air - Assessment Overview - It is stated that industry standard emission factors are used (EEMS,2008). Please clarify where the NOx emission factor is derived from since the referenced source does not detail emission factors for DLE turbines.

29. Section 7.2.5.1 - Main Power Generation - It is stated 'The FPSO currently has three dual fuel SGT-400 Dry Low Emission (DLE) Siemens Gas Turbine Generators (GTG) two of which are rated at 12.3 MW and one at 15 MW electrical output.'. The technical specifications for the units are understood to be 12.9MWe and 14.9MWe respectively. The 14.9MWe rating is for mechanical drive compression which is understood not to be the case for the Western Isles FPSO. Please clarify including whether this affects any emissions calculations.

30. Table 7-7 - Emissions Estimates - Please clarify the source of the data in this column since the information contained within Table 7-6 appears to show a higher fuel gas demand per annum even in the last year of production e.g., 2050 = 94,374kg fuel gas/day which is 34,447t/annum. Within table 7-7, the total fuel gas divided by the number of years is significantly lower. Even accounting for diesel and flaring this still does not equal the figure derived from table 7-6. Please also explain the emissions factors applied as some diesel factors do not appear correct. In addition, 'Rate' would suggest mass per unit time, but this does not appear correct. Please clarify.

31. Table 7-9 - Emissions associated with shuttle tanker engines between 2026 and 2050 - i) The text above the table states 'The emissions estimates presented below also account for shuttle tanker transit and offloads to an

onshore reception facility. Shuttle tanker emissions have been estimated, based on the likely transit voyage duration and the likely fuel consumption.'. It is unclear if the transit duration includes travel to the Buchan location. Table 3-20 details shuttle tanker transit times and fuel use but, it is unclear if this includes transit to and from the field. Please clarify. ii) Table 3-20 details shuttle tanker fuel use/annum. However, the total fuel use for field life does not appear to equate to the emissions specified in Table 7-9. Please provide details of the calculation.

32. Section 7.2.5.7 - Minimising GHG emissions during the production phase - It is stated 'Potential power generation downtime will be reduced by consultation with the original equipment manufacturer to establishing the root cause of the power generation outages – and rectifying these accordingly to ensure the GTG system uptime is maximised.'. Please confirm that these issues will be rectified before start of production to demonstrate that the ES assess worst case emissions.

33. Table 7-11 - Total pre-production emissions for the proposed Buchan Redevelopment Project - Please clarify the source of these emissions i.e., where in ES is this taken from; and show how they have been determined.

34. Table 7-12 - Total annual production emissions for the proposed Buchan Redevelopment Project during peak year - i) Please clarify the source(s) of this data i.e., where in ES is this taken from? ii) Please clarify why 2027 is regarded as the peak year for emission when 2030 and 2031 are higher as per Table 7-14. Where necessary please provide updated Table(s).

35. Table 7-13 - Overall peak annual emissions for the proposed Buchan Redevelopment Project - Please clarify the source(s) of this data i.e., where in ES is this taken from?

36. Section 7.3.2 - GHG Emissions and Intensity of Production - Based on the data in Table 7-14 OPRED cannot replicate the GHG intensities presented in the last paragraph of this section. Please detail how these were calculated.

37. Table 7-14 - Proposed Project GHG emissions and production carbon intensity - Please check the total development emissions (without electrification) - currently 2,758kteCO2e as there may be an error.

38. Table 7-15 - Western Isles FPSO emission estimates (including electrification) between 2026 and 2050 - it is unclear what the data in the column titled 'Rates (2026-2050) (te)' is. 'Rate' would suggest mass per unit time but his does not appear correct. Please clarify including the source(s) of this data.

39. Table 7-16 - Western Isles FPSO emissions reduction following electrification - The source of this data is unclear i.e., where in ES is this taken from? Please clarify.

40. Section 7.5 - Emissions Performance Benchmarking - Whilst comparison has been drawn with the average UKCS GHG intensity of 22.9kgCO2e/boe, the relevant metric for comparison is to the floating installation <10 years age which is 18.3kgCO2e/boe. NEO have reflected this in Figure 7-1 and indicated that the estimated Buchan FPSO GHG intensity for the first 10 years of production is 15.9kgCO2e/boe. Based on the data in Table 7-14, OPRED is unable to verify this calculation. Please detail how this was calculated.

41. Table 7-19 - Comparison with emissions from the UK and from the UKCS as reported in 2021 - The N2O and CH4 UK emissions do not appear to align with the cited source (NAEI, 2023). Please clarify.

42. Table 7-22 - Buchan Redevelopment GHG emissions in the context of the North Sea Transition Deal - Please clarify the source of the data in the fourth column i.e., where in the ES is this data taken from?

43. Section 8.1.1.2 - Cement and Cementing Chemicals - The first bullet points in this section don't appear to follow on from the text in the preceding sentence, suggesting missing text. Please clarify.

44. Section 8.1.3.2 - Produced Water Discharges - With regard to PWRI, OPRED is aware of some cases in industry where PWRI pumps have been by-passed and produced water discharged overboard where oil in water concentration exceed 20mg/l due to the pumps being incapable of operation at this oil concentration. Please clarify if the PWRI pumps will be designed such that they can operate at the expected oil in water concentration for the Western Isles FPSO.

45. Section 8.2.1 - Impacts Associated with the Drilling Phase - It is noted that cetacean presence is given as one of the reasons for the selection of 'Medium' sensitivity for receptor. The definition for 'High' receptor sensitivity within Table 5-1 includes 'Significant numbers of at least one receptor of regional (European) importance (e.g. Annex II/IV species and OSPAR designations). Given cetaceans sit within these categories, please clarify why 'High' wasn't selected for receptor sensitivity. Please note this applies to all impact assessment sections of the ES where cetaceans are classed as 'Medium' for receptor sensitivity.

46. Section 9.1.2 - Drill Cuttings and Drilling Mud Discharges - Please clarify why the time period of 32 days after drilling discharges end has been selected when conveying the level of risk presented by drill cuttings.

47. Table 9-1 - Area of seabed impacts - Please clarify why 1,000m has been used in the calculation for anchor line impact when it is stated that 1,280m of each anchor will be in contact with the seabed.

48. Section 9.6 - Seabed Disturbance Impact Assessment - i) This section states ' It can be seen that the anticipated location of the proposed wells and subsea infrastructure are not in the immediate vicinity of these piles.'. The footprint of the cuttings piles has not been shown so this statement can't be verified.

Please provide evidence to support this statement. ii) It is stated 'Finalisation of the mooring layout for the semi-submersible drilling rig will take account of the presence of these historic cuttings piles with disturbance being avoided/minimised where possible.' and when referring to a previous decommissioning programme 'The modelling showed that the key contributor to risk from disturbing the largest of the historic cuttings piles was from the chemicals they contained with the area impacted reducing significantly over time – reduced by > 99 % over 10 years'. If the MODU mooring system may impact these cuttings piles, please provide a more complete assessment of impact.

49. Section 9.6 - Proposed Mitigation Measures - It is stated 'The proposed gas export route will take the most direct/shortest route to the Ettrick PLEM or Tweedsmuir manifold subject to seabed conditions encountered;'. Please confirm that any sensitive habitats will also be taken into account during route planning.

50. Section 10.5 - Underwater Noise - Mitigation Measures - Please confirm that the soft start of piling activity is expected to be achievable if there is a break in piling that requires resumption of activities part-way through piling i.e., is there any indication that the soils in the area or another technical reason that would prevent this.

51. Appendix B - Aspects Register - i) Row 1-12 - With regard to the spillage of vessel fuel, evaporation is stated to be high. The degree of evaporation of ULSFO (0.1% S) and VLSFO (<0.5% S) fuel oils has been shown to be very low in some cases and typically ca. <5% (e.g. Daling, 2020). As such, evaporation would not necessarily be a significant weathering route for a ULSFO spill. Please clarify if this changes the impact assessment.

52. Appendix C - Cuttings Dispersion Modelling - Section 3.4.5 - Please clarify why C15-16 is conservative. Would a heavier fraction be more conservative as this would be more likely to pass through a TCC (less volatile). A heavier fraction would be more representative of fractions that are likely to survive TCC and therefore be discharged. Please clarify.

53. Appendix E - Oil Spill Modelling - i) Section 4.1.1 - Please review the mass balance of hydrocarbon in the well blowout scenario for biodegraded oil as the data in this section doesn't align with Table 12-3 in the ES.

Your response will be reviewed, and consideration given as to whether the information provided ought to be made public because the information is directly relevant to reaching a conclusion on whether the project is likely to have a significant effect on the environment. If so, OPRED will notify NEO Energy (ZEX) Limited under Regulation 12(3), and NEO Energy (ZEX) Limited will have to take further steps to publish information and make provision for further public consultation under Regulations 12(5) to 12(9).

OPRED looks forward to receiving your response so that we can progress our consideration of the ES.

Yours sincerely

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[redacted]

Environmental Manager

The Offshore Petroleum Regulator for Environment and Decommissioning

For and on behalf of the Secretary of State for Energy Security and Net Zero