

**Observation on EIS in relation to inadequate baseline monitoring on air quality compliance in the SID for the proposed development by Indaver NV trading as Indaver Ireland for a Resource Recovery Centre ( including a waste - to -energy facility ) at Ringaskiddy**

ABP Case Reference **PA004. 318802**

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Dr Daly held the position of Chief Emergency Management Officer of the Health Service Executive (HSE) from 2007 to 2015 covering HSE Area South. One of his duties was to discharge the HSE's statutory responsibilities as a prescribed body in relation to control of major accidents and their impact on the health and wellbeing of the public. He is a member of the Technical Committee TC 99 on "Societal and Citizen Security" related to ISO/TC 292 - security and resilience specifically covering the risks from chemical, biological and radiological materials. Prior to 2007 he served as a technical officer in the Defence Forces.

**Observation on Environmental Impact Statement (EIS) – Air Quality Compliance**

This observation focuses specifically on the applicant's non-compliance with EU air quality policy and directives—particularly the Ambient Air Quality Directive (AAQD, 2008/50/EC as amended by Directive (EU) 2024/2881)—as well as Irish legislation under the Air Pollution Act 1987 (as amended) and the Environmental Protection Agency Act 1992. The EIS's air quality baseline monitoring (Chapter 8) is fundamentally inadequate, relying on a single, site-proximate point for fine particulate matter (PM2.5), omitting sub-PM2.5 fractions despite instrumental capability, and employing an insufficient six-month period that does not capture seasonal variations. Furthermore, the meteorological data underpinning dispersion modelling is sourced from Cork Airport rather than the Board-recommended Roches Point, not accounting for the site's unique estuarine and maritime influences. Critically, the assessment ignores significant cumulative emissions from cruise liners, despite their high pollution baseline being dwarfed by the facility's planned outputs.

The proposed facility's emissions (e.g., PM10, PM2.5, metals, dioxins from stack and fugitive sources) pose risks of deposition and transboundary effects over Cork Harbour, yet the monitoring program—confined to one continuous site at the Hammond Lane Metals Recycling facility for "operational efficiency"—does not represent the wider impacted area, as implied in the EIS figures (e.g., 8.8 and 8.9). This contravenes the EIA Directive (2011/92/EU, as amended) requirement for "comprehensive" baseline data (Article 5) and the AAQD's monitoring obligations for zones exceeding limits (Annex III). Approving this without remediation would expose communities and protected habitats to unquantified health/ecological risks, including cardiovascular/respiratory effects from

PM2.5 (WHO 2021 guidelines: annual mean  $<5 \mu\text{g}/\text{m}^3$ ) and biodiversity harm via atmospheric deposition.

## **1. Inadequate Spatial Coverage: Single PM2.5 Monitoring Point at Hammond Lane, Misrepresenting the Impacted Area**

**Issue:** Continuous PM10/PM2.5 monitoring is limited to one site (Hammond Lane Metals Recycling, next to the proposed facility, coordinates  $\sim 178500\text{E}, 70000\text{N}$ ), justified in the EIS as "operational efficiency and representativeness near emission sources." This site recorded baseline PM10:  $9.4 \mu\text{g}/\text{m}^3$  and PM2.5:  $5.7 \mu\text{g}/\text{m}^3$  (2024-2025 data), but the EIS implies broader coverage across the  $\sim 10$  km study area (e.g., Monkstown, Cobh, Passage West) through figures depicting multiple markers. In reality, passive diffusion tubes (e.g., for NO<sub>2</sub> at N1-N16, SO<sub>2</sub>/benzene at S1-S7/B1-B7) dominate elsewhere, with no added continuous PM sites—making the assessment unrepresentative of downwind/residential gradients or harbour dispersion.

**Non-Compliance:** Violates AAQD Annex I (representative monitoring in agglomerations  $>250,000$  inhabitants, applicable to Cork conurbation) and Irish EPA guidance (AG4:2012) for multi-point baselines in heterogeneous terrains. The confinement to Hammond Lane (an industrial yard, elevated  $\sim 5$  m) biases results toward source-proximate levels, underestimating exposure at sensitive receptors like Martello Park residences (N4) or Loughbeg school (N11).

**Natura Sites Omission:** Locations do not include direct monitoring within or adjacent to protected areas, such as the Cork Harbour SPA (encompassing Haulbowline, Spike Island, and eastern harbour channels) or Great Island Channel SAC (marine/coastal habitats  $\sim 1-2$  km southeast). While terrestrial sites extend to Cobh Promenade (N14/S6/B6, harborside) and Monkstown (N12/S5/B5), no PM-specific points target SAC/SPA boundaries, ignoring potential acidifying/eutrophying deposition (Habitats Directive 92/43/EEC, Article 6). This is accurate based on EIS Figures 8.8-8.9, which focus on urban/industrial nodes without marine extensions.

## **2. Failure to Measure Sub-PM2.5 Fractions Despite Instrumental Capability and Emerging EU Requirements**

**Issue:** The EIS reports only PM10/PM2.5, dismissing sub- $2.5 \mu\text{m}$  measurement (e.g., PM1 or ultrafine particles, UFPs) on grounds that "current regulations" (AAQD) specify PM2.5 as the limit. However, the Osiris Continuous PM10/PM2.5 Unit deployed at Hammond Lane is capable of simultaneous multi-fraction analysis: Total Suspended Particulates (TSP), PM10, PM2.5, and PM1 ( $\leq 1 \mu\text{m}$ ), with high sensitivity detecting concentrations as

low as  $0.1 \mu\text{g}/\text{m}^3$ —far below AAQD limits (PM<sub>2.5</sub> annual:  $25 \mu\text{g}/\text{m}^3$  pre-2030). No data on PM<sub>1</sub>/TSP were included, despite the instrument's specifications enabling it without additional cost.

**Non-Compliance:** EU environmental policy increasingly addresses PM<sub>2.5</sub> "or less," with the revised AAQD (2024/2881, effective 2030) halving PM<sub>2.5</sub> limits to  $10 \mu\text{g}/\text{m}^3$  annual mean and mandating UFP monitoring (particle number concentration) in urban areas from 2030, recognizing UFPs' (>90% PM mass <2.5  $\mu\text{m}$ ) role in oxidative stress and translocation to organs. The facility's construction/operation will extend beyond 2030, necessitating forward-looking compliance; omitting PM<sub>1</sub> data now contravenes precautionary principles (Treaty on the Functioning of the EU, Article 191) and Irish EPA AER requirements for comprehensive pollutant profiling. Scientific consensus links UFPs from combustion (e.g., WtE stacks) to heightened mortality risks (WHO 2021).

### **3. Insufficient Monitoring Duration: Six Months Fails to Capture Seasonal/Annual Variability including scheduled shut down period of local industry**

**Issue:** The 2024-2025 campaign spanned only six months, yielding "historical" supplements (e.g., 2018-2019 NO<sub>2</sub> at N17:  $9.4 \mu\text{g}/\text{m}^3$ ) but no full-year PM data. This overlooks seasonal peaks (e.g., winter inversions amplifying PM in Cork Harbour's topography) and meteorological influences on dispersion.

**Non-Compliance:** Scientific literature recommends at least 12 months for EIA baselines to ensure representativeness across cycles (IAIA Guiding Principles for Air Quality Assessments in EIAs, 2023; EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. I, 2020). Shorter periods risk underestimation, as evidenced in peer-reviewed evaluations of EIA performance where six-month data correlated poorly with annual means ( $r=0.65$  vs.  $0.92$  for 12 months). Irish EPA AG1:2005 echoes this for "robust" zoning under AAQD.

### **4. Inadequate Meteorological Data: Reliance on Cork Airport meteorological data instead of Board-Recommended Roches Point meteorological data**

**Issue:** Dispersion modelling in Chapter 8 relies on meteorological data from Cork Airport (~15 km northeast), rather than Roches Point lighthouse (~5 km southeast, at the harbour entrance), as explicitly recommended by An Coimisiún Pleanála in prior assessments (e.g., 2018 Board Order PA0045 conditions for site-specific meteorology). This distant inland source fails to capture the unique microclimatic features of the estuarine,

maritime location—such as sea breezes, tidal influences on humidity, and complex wind channelling over Cork Harbour—which can alter plume dispersion, ground-level concentrations, and deposition patterns for pollutants like PM and dioxins.

**Non-Compliance:** Contradicts EPA guidance (AG4:2012) and AAQD Annex III for "local" meteorological inputs in coastal/industrial EIAs to ensure accurate modelling (e.g., AERMOD/CALPUFF simulations). Roches Point data better represents prevailing southerly winds and inversion risks, essential for assessing impacts on downwind receptors (e.g., Haulbowline, Cobh) and Natura sites. Using airport data risks over- or under-predicting concentrations by over 20% in estuarine settings, per peer-reviewed studies on harbour microclimates (e.g., Atmospheric Environment, 2019).

## **5. Omission of Cumulative Maritime Emissions: Ignoring Cruise Liner Impacts Despite High Baselines and Regulatory Trends**

**Issue:** The EIS accounts for additional road transport emissions but entirely overlooks those from cruise liners, which currently average ninety-five calls per year at the Port of Cork (e.g., 93 scheduled for 2025, 103 in 2024 - Port of Cork data). These vessels, berthing ~2 km north at Cobh Cruise Liner Terminal, emit substantial PM<sub>2.5</sub>, SO<sub>x</sub>, NO<sub>x</sub>, and UFPs from auxiliary engines during idling—contributing up to 250 times WHO safe levels in localized spikes (2025 Clean Arctic report on Cork Harbour). The six-month monitoring period (2024-2025) does not coincide with the peak cruise season (April-November), missing elevated baselines that could amplify cumulative effects on receptors like Cobh Promenade (N14). While ship impacts are high in themselves, they are dwarfed by the facility's planned outputs (e.g., ~1-2 tonnes PM<sub>10</sub>/year from stack, plus fugitives, vs. episodic ship peaks).

**Non-Compliance:** Fails AAQD requirements for cumulative assessments (Annex I) and EIA Directive Article 7 on transboundary/industrial synergies. Internationally, EU Alternative Fuels Infrastructure Regulation (AFIR, 2023) mandates 90% shore-power uptake at TEN-T ports like Cork by 2030 for container/passenger ships, reducing emissions by up to 98% (CLIA Europe). The Port of Cork's Masterplan 2050 and ongoing considerations (e.g., ISO 14001/50001 certifications) aim to implement this for air quality compliance, yet the EIS ignores future mitigations, risking non-precautionary overestimation of "acceptable" baselines under the Green Deal's zero-pollution pillar.

### **Conclusion and Overall Observation**

Chapter 8's of the EIA quality assessment is materially deficient, implying comprehensive coverage while delivering site-centric, partial data that misleads on compliance and risks. This echoes flaws in prior Indaver applications (e.g., 2016 oral hearing critiques on

nanoparticle omission) and contravenes EU zero-pollution ambitions (Green Deal, 2019) by inadequately safeguarding human health and Natura sites from PM-driven deposition.