ZEROF

Ethics plan

Deliverable D1.2

Version N°1.0

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Summary

This Ethics Plan provides a jointly agreed framework for the ZeroF ethics management. The deliverable outlines the ethical issues and procedures related to the research activities to be performed in ZeroF. In particular, the Plan details the forthcoming actions and responsibilities for the consortium members to ensure that ethics requirements are carefully fulfilled.

As a whole, the ZeroF project is carried out according to the highest ethical standards and the applicable EU, international and national law on ethical and research integrity principles. Moreover, the beneficiaries are devoted to ensuring the respect of fundamental EU values, such as respect for human dignity, freedom, democracy, equality, and the rule of law and human rights, including the rights of minorities.

In addition to the general ethics principles and relevant legislation, the consortium commits to following the practices jointly agreed in this document. This includes, for example, that all consortium members are responsible for immediately informing the Coordinator if they notice an unexpected or new ethical issue. 'Ethics' will be included as a fixed agenda point for each ZeroF General Assembly meeting to ensure that any ethics-related questions and issues raised during the project can be addressed in a timely manner collaboratively by consortium members.

We begin with definitions of general research ethics and research integrity principles. Then, a statement of the consortium's compliance with the principles is provided. This is followed by separate sections where the specific ethical dimensions relevant to ZeroF are addressed. Then, the ethics monitoring process in ZeroF is discussed. Finally, the deliverable is ended with conclusions.

The document is a core part of Task 1.3 (T1.3) *Ethics management* which aims to ensure that the ethics regulations and rules are respected. The task is led by VTT who is also responsible for this deliverable. As task leader, VTT acts as Ethics Mentor, monitoring the ethics issues involved in the project and how they are handled. While VTT coordinates T1.3, all consortium members are responsible for behaving and working according to the highest ethical principles and in good faith.

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List of Beneficiaries and Associated Partner

VTT	Teknologian Tutkimuskeskus VTT Oy, Finland; Project Coordinator
LEITAT	Acondicionamiento Tarrasense Associacion, Spain
FRA	Fraunhofer Gesellschaft zur Forderung der Andgewandten Forschung ev, Germany
LIST	Luxembourg Institute of Science and Technology, Luxembourg
KEM	Kemira Oyj, Finland
UniBo	Alma Mater Studiorum – Università di Bologna, Italy
IDEA	Ideaconsulting Limited Liability Company, Bulgaria
LGI	LGI Sustainable Innovation, France
AEI	Associacio Agrupacio d'Empreses Innovadores Textils, Spain
ECIM	E. Cima SA, Spain
YAN	Yangi AB, Sweden
TEMASOL	Temas Solutions GMBH, Switzerland (Associated Partner)

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1 Introduction

This Ethics Plan outlines the ethical aspects and procedures related to the research activities to be performed in ZeroF. It also acts as a plan for ethics management for the project. The plan has been prepared by VTT with the guidance of relevant sections from the EC's guide *How to complete your ethics self-assessment*[1]. VTT monitors the ethics processes throughout the project, and the whole consortium is proactively involved in ethics management.

The ZeroF project is carried out in line with the highest ethical standards and the applicable EU, international and national law on ethical principles, and the provisions set out in the Grant Agreement. In parallel, the ZeroF Ethics Plan is based on the ethical principles and relevant Union, national and international legislation, including the Charter of Fundamental Rights of the European Union and the European Convention on Human Rights and its Supplementary Protocols. In addition, it is expected that the work of the ZeroF consortium is carried out in good faith and goodwill.

The following sections of this deliverable address the core aspects of ethics monitoring and management in the ZeroF project. We begin by defining general research ethics and research integrity principles. This is followed by a statement of the consortium's compliance with the general principles and regulations. Then, the relevant ethical dimensions identified in the proposal phase of ZeroF are addressed. This section is followed by a presentation of the project's the ethics monitoring process. Finally, conclusions are presented.

2 Ethical research practices

2.1 Research ethics

The term *research ethics* is a general concept that covers all ethical viewpoints and evaluations that are related to science and research. In general, ethics are norms of conduct that distinguish between acceptable and unacceptable behaviour. As people can interpret ethical norms in different ways in light of their own values and life experiences, it is necessary to establish common definitions and rules in the framework of the project.

In the ZeroF project, 'ethics' is perceived as defined by the European Commission (EC)[2] according to which, ethics

> "includ[e] questions of legal and regulatory compliance as well as a branch of philosophy. It is part of a process of 'governance'. The consideration of ethical issues, starting at the conceptual stage of a proposal, enhances the quality of research, increases its likely social impact, promotes research integrity, promotes a better alignment of research with social needs and expectations and, finally, supports the societal uptake of the fruits of research because high

[1] How to complete your ethics self-assessment, Version 2.0, 13 July 2021.
https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/how-to-complete-your-ethics-self-assessment_en.pdf

[2] Roles and Functions of Ethics Advisors/Ethics Advisory Boards in EC-funded Projects.
https://ec.europa.eu/research/participants/data/ref/h2020/other/hi/ethics-guide-advisors_en.pdf

> ethical standards generally merit public trust. In this spirit, the Commission aims to build a relationship between the research process and ethics that is collaborative and constructive (rather than negative and inhibitive)."

The ZeroF consortium acts in line with this notion and sees complying to research ethics as the core for conducting high-quality research. In particular, the ethical norms sustained in ZeroF are Impartiality, Reliability, Integrity, and Responsibility. These norms stress the importance of good and responsible practices and lay the foundations for sincere, reliable, and confidential cooperation among the consortium members and other stakeholders. The norms are closely tied with the notion of research integrity which is addressed next.

2.2 Research integrity

In addition to research ethics, good research practices are based on fundamental principles of *research integrity*. Research integrity emphasises the honesty and integrity that all researchers are required to adopt in their research activities. The research integrity principles guide researchers in their work as well as in their engagement with the practical, ethical, and intellectual challenges inherent in research.

The beneficiaries are committed to respecting the fundamental principle of research integrity as set out in the *European Code of Conduct for Research Integrity*[3] document provided by ALLEA - All European Academies -group. The ALLEA document states that "good research practices are based on fundamental principles of research integrity. They guide researchers in their work as well as in their engagement with the practical, ethical, and intellectual challenges inherent in research".

According to the European Code of Conduct for Research Integrity, the fundamental principles of research integrity are:

- reliability in ensuring the quality of research reflected in the design, the methodology, the analysis, and the use of resources
- honesty in developing, undertaking, reviewing, reporting, and communicating research in a transparent, fair, full, and unbiased way
- respect for colleagues, research participants, society, ecosystems, cultural heritage, and the environment
- accountability for the research from idea to publication, for its management and organisation, for training, supervision, and mentoring, and for its wider impacts.

In addition to the European Code of Conduct for Research Integrity, the beneficiaries are committed to following other relevant international and national research integrity guidelines. For example, VTT has committed to complying with the guidance of The Finnish National Board on Research Integrity TENK's Responsible Conduct of Research, RCR[4]. VTT expects all beneficiaries to respect ethical principles and advices in ethical questions.

[3] European Code of Conduct for Research Integrity of ALLEA (All European Academies) https://www.allea.org/wp-content/uploads/2017/05/ALLEA-European-Code-of-Conduct-for-Research-Integrity-2017.pdf

[4] The official website of the Finnish National Board of Research Integrity TENK for the Responsible Conduct of Research (RCR) https://tenk.fi/en/research-misconduct/responsible-conduct-research-rcr

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2.3 Contexts of ethical research practices

Good research practices – which are based on the previously addressed research ethics and research integrity – apply to different contexts of the project's processes. These contexts are defined by ALLEA as follows:

- Research Environment
- Training, Supervision and Mentoring
- Research Procedures
- Safeguards
- Data Practices and Management
- Collaborative Working
- Publication and Dissemination
- Reviewing, Evaluating and Editing

Continuous supervision and guidance are done by the management of the project to ensure that good research practices are sustained in all these contexts. Notably, all participating organisations as well as individual researchers and management staff are responsible for following good research practices in all of the relevant contexts. This includes reporting of any misconduct that might be detected (addressed in more detail in Section 2.5).

2.4 Notes on communication, publication, and dissemination activities

The ZeroF general communication, publication and dissemination principles are based by design on high ethical conduct. The basic principles of these activities are defined in the Deliverable 1.1 *Project Quality Management Plan* which was completed and submitted in February 2023. The details of these principles are addressed in depth in the Deliverable 7.1 *Dissemination and Communication Plan* of which the first version is to be submitted to the EC in April 2023. Therefore, in this section, we limit to mention a few fundamental aspects on ethics in communication, publication, and dissemination activities of the project.

Regarding the content of research, the ZeroF researchers acknowledge that, unless otherwise specified, they are fully responsible for it from the beginning to publications. The authors should ensure that their work is made available to colleagues in a timely, open, transparent, and accurate manner, unless otherwise agreed. When communicating with the general public and the media, the ZeroF consortium members are fully committed to honesty and impartiality.

Regarding authorship, the ZeroF researchers have committed to acknowledging that authorship itself is based on a significant contribution to the design of the research, relevant data collection, or the analysis or interpretation of the results. The consortium members must acknowledge the work and intellectual contributions of others, including collaborators, assistants, and funders.

In this line, all communication, publication, and dissemination activities must include (whenever possible) the following EC and SERI's acknowledgement of funding including the following disclaimer:

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The texts should be translated into local languages, where appropriate.

In addition to acknowledging the received funding and the contribution of fellow researchers and sources of information, the ZeroF consortium members have committed to disclosing any conflicts of interest and financial or other types of support for the research or for the publication of its results.

2.5 Research misconduct and other unacceptable practices

The ZeroF consortium has a zero-tolerance policy for research misconduct, disregard for responsible conduct of research and other unacceptable practices in research.

Research misconduct can be, for example (the list is not exhaustive),

- fabrication, i.e., making up results and recording them as if they were real.
- falsification, i.e., manipulating research materials, equipment or processes or changing, omitting, or suppressing data or results without justification.
- plagiarism, i.e., using other people's work and ideas without giving proper credit to the original source, thus violating the rights of the original author(s) to their intellectual outputs.
- misappropriation, i.e., unlawful presentation of another person's result, idea, plan, observation, or data as one's own research.

Sometimes, research violations are not as distinct in which cases they can be seen as disregarding the responsible conduct of research. Examples of these can be (the list is not exhaustive):

- denigrating the role of other researchers in publications
- reporting results and methods in a careless manner, resulting in misleading claims
- inadequate record keeping and storage of results and data
- publishing the same results many times as novel results (self-plagiarism)
- misleading the research community in other ways.

In addition, there are other unacceptable research practices practises which are condemned. These can be, for instance,

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- manipulating authorship
- exaggerating one's own achievements (e.g., in CV)
- re-publishing substantive parts of one's own earlier publications without duly acknowledging it ('self-plagiarism')
- citing selectively to enhance own findings or to please editors, reviewers, or colleagues
- withholding research results
- delaying the work of other researchers e.g., in the peer-review process
- allowing funders/sponsors to jeopardise independence in the research process or reporting of results
- accusing a researcher of misconduct or other violations in a malicious way
- exaggerating the importance and practical applicability of findings

To prevent any kind of misconduct, disregard, or other unacceptable practice to take place, the ZeroF consortium expects responsible behaviour and work from all its researchers and implements clear ethics monitoring processes. These are defined in Section 5 of this document.

3 Compliance with general ethical principles and relevant legislation

In line with Article 14 of the Grant Agreement, the project is carried out according to the highest ethical standards and the applicable EU, international and national law on ethical and research integrity principles. This includes the EU Charter of Fundamental Rights and the European Convention for the Protection of Human Rights and Fundamental Freedoms and its Supplementary Protocols. Moreover, the beneficiaries are devoted to ensuring the respect of basic EU values (such as respect for human dignity, freedom, democracy, equality, the rule of law and human rights, including the rights of minorities).

Throughout the project lifecycle, the beneficiaries are committed to paying particular attention to the principle of proportionality (no harm approach), the right to privacy, the right to the protection of personal data, the right to the physical and mental integrity of persons, the right to non-discrimination, the need to ensure the protection of the environment, and high levels of human health protection. The beneficiaries must ensure that the activities under the action have an exclusive focus on civil applications.

In particular, as stated in the Grant Agreement Annex I Part B Section 4.3, the consortium confirms respecting national and EU legislation, including:

- Declaration of Helsinki 1964 (version 2013).
- EU Directive on the Protection of Data: 95/46/EC.
- The Charter of Fundamental Rights of the European Union.

- EC Directive 86/609/EEC; ETS 123, 2010/63/CE.
- Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions.
- Declaration of Helsinki of the WMA (DoH2008).
- EG-GCP Note for Guidance.
- ETS N. 195 of 25.01.2005. Additional Protocol to the Convention on Human Rights and Biomedicine, concerning Biomedical Research.
- International Ethical Guidelines for Biomedical Research Involving Human Subjects. Council for
- International Organisations of Medical Sciences (CIOMS) ISBN 92 9036 075 5.
- Decision No 1982/2006/EC of the European Parliament and of the Council of 18 December 2006.
- Directive 2001/20/EC of the European Parliament and of the Council of 4 April 2001 on the approximation of the laws, regulations and administrative provisions of the Member States relating to the implementation of good clinical practice in the conduct of clinical trials on medicinal products for human use. OJ L 121, 1.5.2001.
- ETS N. 164 of 04/04/1997. Convention for the protection of Human Rights and Dignity of the Human
- Being with regard to the Application of Biology and Medicine: Convention on Human Rights and
- Biomedicine.
- 13ETS N. 168 of 12/01/1998. Additional Protocol to the Convention for the Protection of Human Rights and Dignity of the Human Being with regard to the Application of Biology and Medicine, on the Prohibition of Cloning Human Beings.

In addition, the consortium states that none of the foreseen work requires authorization under the Nagoya protocol.

All cell lines used within ZeroF are certified "free of pathogens" and all of them are considered to pose no (bio-safety level 1 (BSL 1)) or moderate (BSL 2) potential hazard. In ZeroF, no biological materials with BSL higher than 2 will be used. Moreover, the consortium confirms that all research staff involved in the handling and disposal of biological materials will or has already received training that is compliant with the standard guidelines for working with BSL 2 agents (as defined by the WHO).

4 Specific ethical dimensions relevant to ZeroF

4.1 Overview

In the evaluation phase, the ZeroF proposal was classified as "ethics ready" and was therefore approved for granting without further ethics clarification requests. However, in the

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project preparation phase, specifical ethical dimensions relevant to ZeroF were identified. These will be taken into particular consideration during the lifetime of the project. The identified dimensions are:

- Humans
- Human cells / tissues
- Personal data
- Non-EU countries
- Environment, health and safety
- Artificial intelligence

These aspects are addressed separately in the following sub-sections of this deliverable. If other ethics dimensions are identified by any consortium member throughout the lifetime of the project, they are requested to contact the Coordinator immediately and take actions as defined in Section 5 of this document.

4.2 Humans

ZeroF improves citizens' safety, environment, and economics through the Safe and Sustainable by Design (SSbD) ideology. The project is also in close contact with regulatory and decision-making bodies and is positively aligned with major EU-level activities (single-used plastic, recycling of textiles, PFAS). The project team has participants across the EU. The cultural interactions are highly cherished and taken into consideration in all dissemination and communication practices. Together with the projects funded from the same EU funding call, ZeroF reaches a larger group of stakeholders that will be informed of project results in a popular manner leading to more awareness of the project research and results amongst citizens across Europe.

4.3 Human cells and tissues

Within ZeroF, several different types of cells and tissue will be used for in vitro hazard assessment. The cell types that will be used are mainly commercially available cancer cell lines and primary epithelial cells of the skin or intestine, and they are fully anonymized and are produced following the strictest ethical guidelines. The ZeroF team members will conduct all studies in adherence to the fundamental ethical principles applicable when conducting the studies:

- The principle of respect for human dignity and the principles of non-exploitation, non-discrimination and non-instrumentalization,
- The principle of individual autonomy (entailing the giving of free and informed consent, and respect for privacy and confidentiality of personal data),
- The principle of justice and the principle of beneficence and non-maleficence, namely with regard to the improvement and protection of health,
- The principle of proportionality (including that research methods are necessary to the aims pursued and that no alternative more acceptable methods are available).

The 3R's (Reduction, Replacement and Refinement) principle for animal care all ZeroF participants confirm that the proposed research does **not** involve any of the issues listed hereafter:

- Research activity aiming at human cloning for reproductive purposes,
- Research activity intended to modify the genome of human beings which could make such changes heritable,
- Research activities intended to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer,
- Research involving the use of human embryos or embryonic stem cells with the exception of banked or isolated human embryonic stem cells in culture.

As a coordinator, VTT sustains that partners responsible for handling human tissue are aware of the current legislation, guidelines and recommendations for the research/studies involving this kind of activity. More details on compliance with ethical principles can be found in Section 5 of this document as well as the Grant Agreement.

Work with commercially available cell lines

The purchase of commercially available cell lines will be done from reliable and standardized sources (ATCC, ECACC). The experiments will be carried out based on accepted experimental protocols, and all measures will be taken for the safe disposal of the cells after the completion of the experiments. LIST will use the following commercially available cell lines: A549 alveolar epithelial cells; THP-1 cells, used in the naïve form (model for dendritic cells) and differentiated (model for macrophages); Ea.hy926 endothelial cells; and intestinal enterocytes Caco-2 cells.

Work with human cells

FRA will work with human epidermal keratinocytes isolated from foreskin biopsies of 2–5 -year-old anonymous donors. Full-thickness jejunal tissues for enterocyte isolation are obtained from obese, anonymous, and adult patients undergoing a stomach bypass operation at the surgery unit of University Hospital Wuerzburg. Biopsies are taken in accordance and with the approval of the local ethics committee (approval number 182/10 at University Hospital Wuerzburg, Germany) and the informed consent of the patients or their guardians for the study participation.

LIST will work with a non-commercially available mucus-secreting intestinal cell model cell line (HT-29/MTX from INERIS-France), for which the institution currently has a research license and will follow a standardized protocol currently being developed by the H2020 project NanoHarmony for future use within the framework of OECD approved TGs.

ZeroF will make use of positive controls with known and proven toxicity for humans and for the environment. All the precautions to ensure the safety of the research staff and of the environment will be taken by the institutions responsible for the handling and final disposal of the chemicals.

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4.4 Personal data

The ZeroF partners will collect personal data for internal project management and communication purposes, stakeholder communication, as well as concerning the consumer and social acceptance of the developed coating as described in WP6. The project-related personal contact information of the project group members is stored in a secured Microsoft Teams group administered by VTT. The access is available only to persons authorised by partners. The necessary information and data required to carry out the evaluations under relevant tasks in WP6 will be compiled in common questionnaires sent to the relevant partners working on WPs 2–4.

The necessary personal data will be collected and stored in line with the requirements of the Grant Agreement Article 15.2. *Data processing by the beneficiaries*. According to the Article, the project beneficiaries must ensure that personal data is:

- processed lawfully, fairly and in a transparent manner in relation to the data subjects.
- collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes.
- adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed.
- accurate and, where necessary, kept up to date.
- kept in a form which permits identification of data subjects for no longer than is necessary for the purposes for which the data is processed.
- processed in a manner that ensures appropriate security of the data.

The beneficiaries will also follow the EU *guideline on completing the ethics self-assessment* (p. 20–26) which states that personal data must be processed in accordance with principles and conditions that aim to limit the negative impact on the persons concerned and ensure fairness, transparency and accountability of the data processing, data quality, and confidentiality.

During the project, the partners will be responsible for managing datasets securely in their possession. The project data management is addressed through the designated *Task 1.4 Data management* to ensure adequate data processing in the project. The data management as a whole will be monitored by the Data Manager, Nina Jeliazkova (Ideaconsult) who was nominated for the task by the ZeroF General Assembly in the first General Assembly meeting on the 1st of March 2023.

The data-related procedures will be described in detail in *D1.3 Data Management Plan* (DMP) which will be submitted in Month 6 of the project, i.e., by the end of June 2023. The DMP will include a description of the methodology and standards to be followed, and what data sets are exploitable or made accessible for verification and re-use. The DMP will be a dynamic tool that is updated regularly throughout the project duration. Moreover, a report on the integration of relevant existing data sources and data provided by partners into a FAIR-compliant database will be provided as *D5.1 Data review and data integration*. These documents will be based on the requirement that the project data is managed according to the highest ethical standards, and applicable international, EU and national law – in

particular, the GDPR (Regulation (EU) 2016/679), the FAIR principles, national data protection laws and other relevant legislation.

4.5 Non-EU countries

One of the ZeroF partners, TEMAS Solutions GMBH (TEMASOL), is from a non-EU country, Switzerland. Activities undertaken there do not raise any potential ethical issues in the project. As defined in the Grant Agreement Article 10.1, TEMASOL undertakes "to comply with their obligations under the Agreement and:

- environmental and labour standards, rules on classified information, intellectual property rights, visibility of funding and protection of personal data.
-
- for the submission of certificates under Article 24: to use qualified external auditors who are independent and comply with comparable standards as those set out in EU Directive 2006/43/EC13.
-
- for the controls under Article 25: to allow for checks, reviews, audits and investigations (including on-the-spot checks, visits and inspections) by the bodies mentioned in that Article (e.g., granting authority, OLAF, Court of Auditors (ECA), etc.)."

As instructed in Section 6. *Non-EU countries* of the guideline *How to complete your ethics self-assessment*, we confirm that the consortium activities comply with the ethics provisions set out in the Grant Agreement, and notably, highest ethical standards as well as applicable international, EU and national law. We confirm that TEMASOL activities are accepted and comply with the legal obligations of a non-EU country, and they are allowed in at least one Member State. The EU has determined that Switzerland has an adequate level of data protection[5] and there are no foreseen concerns of materials, methods, technologies, or knowledge developed within ZeroF being misused for unethical purposes.

If any ethical issues arise unexpectedly during the project, these will be handled according to the ethics monitoring processes defined at the end of this document.

4.6 Environment, health, and safety

The health and safety of the environment and humans is a priority in the ZeroF project. Moreover, the technological solutions developed in ZeroF are expected to be Safe and Sustainable by Design (SSbD). Next, particular aspects related to the environment, health, and safety of the research are addressed.

Handling of hazardous compounds:

All ZeroF personnel will be instructed on general guidelines for the safe handling and disposal of chemicals. In line with the principle, all compounds that will be used within ZeroF will be treated as hazardous compounds and the research staff will be instructed to handle them with great care. LIST has approved guidelines for waste handling (chemical waste,

[5] https://commission.europa.eu/law/law-topic/data-protection/international-dimension-data-protection/adequacy-decisions_en

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biological waste) and is assigned the national label from the "SuperDreckskescht" for complying with all regulations in place in Luxembourg for waste collection, separation, and delivery.

Research staff will be instructed to all use protective equipment (e.g., laminar flow cabinet, glove box) and personal protection gear (e.g., gloves, glasses, protective mask) in order to avoid any incidental exposure to hazardous materials.

Disposal of hazardous compounds:

All plastic ware (e.g., vials, cell culture plates, trans-well inserts, etc.) and biological fluids (e.g., cell culture media) that will enter in contact with potentially hazardous materials will be disposed according to the procedures for special biological and/or chemical waste, which are already in place at the specific institutions.

Endangered fauna and/or flora and protected areas:

All research activities within ZeroF will take place in confined laboratories and they do **not** foresee any use of endangered fauna or flora.

4.7 Artificial intelligence

The ZeroF consortium plans to build and use computational models for predicting material properties in WP5. Our goal is to develop and use machine learning systems in order to predict properties and guides that are safe and sustainable by design. The QSAR and similar models to be utilised in the project have been routinely used for decades, originating from the year 1860 and are not necessarily classified as AI. Therefore, we do not foresee that these would pose critical risks or ethics issues related to AI. If or when relevant, the ZeroF consortium will follow the EC guideline *Ethics By Design and Ethics of Use Approaches for Artificial Intelligence*[6] and sustain the European approach to artificial intelligence[7].

5 Ethics management in ZeroF

Ethics management is a horizontal theme that pierces all activities of the ZeroF project throughout its lifespan. Ethical compliance is monitored, in particular, through Task 1.3 Ethics Management which is led by VTT and supported by all project partners. The aim of all ethics activities, including this Ethics Plan, in the project is to ensure that the provisions on ethics regulations and rules are respected.

The central ethics monitoring tools and activities of ZeroF are as follows:

1. **Ethics Plan:** The document at hand serves as the main tool for all members of the consortium to 1) familiarise themselves with the ethical principles and regulations that the consortium is committed to as well as the ethics issues that need particular attention in the project, and 2) refer to jointly agreed ethics monitoring activities and guidelines.

[6] https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/ethics-by-design-and-ethics-of-use-approaches-for-artificial-intelligence_he_en.pdf
[7] https://digital-strategy.ec.europa.eu/en/policies/european-approach-artificial-intelligence

2. **Shared and personal responsibility:** While VTT leads the ethics management task, each ZeroF consortium member is responsible for complying with the set ethical principles and relevant legislation. Moreover, everyone is expected to report on any new ethical issues they might come across during the course of the project. VTT acts as **Ethics Mentor** to the consortium members on a need basis.
3. **Regular meetings:** Ethics will be a fixed topic in each General Assembly meeting of the project. Moreover, ethical issues are going to be discussed in the more frequent Management Committee meetings whenever necessary.
4. **Project Quality Management Plan (PQMP):** The PQMP (D1.1) was developed in order to ensure (i) the management of project-related documentation, (ii) monitoring and quality control of project deliverables and milestones, and (iii) risk contingency management. Acting according to the agreed principles is crucial for ensuring that the ZeroF project is executed in a high-quality, timely, and ethical way.
5. **Data Management:** Data management is closely connected to the ethical conduct of research and therefore the **Data Management Plan (DMP)** acts as an important tool for ensuring good ethics practices as well. The DMP is updated regularly throughout the project. The **Data Manager**, Nina Jeliazkova, appointed to the position by the ZeroF General Assembly, will monitor the project data management as a whole.
6. **Risk Management Plan:** Risk management is also tied closely to ethics management. The project risks are addressed as a fixed agenda point in the General Assembly meetings.
7. **Process for handling allegations of research misconduct:** As stated earlier in this document, the ZeroF consortium has a zero-tolerance policy for research misconduct, disregard for responsible conduct of research and other unacceptable practices in research. Should any consortium member detect such activity, they must inform the Coordinator without delays. The Coordinator then investigates the matter and takes necessary actions to make sure that any potential risks, breaches of information, or harm are minimised. If necessary, the Coordinator informs the HaDEA Project Officer.
8. **Record keeping:** the consortium maintains detailed records of all ethical decisions and actions taken during the project, including minutes of consortium body meetings, reports on any ethical breaches, and documentation of any modifications made to the ethics plan.

Overall, the monitoring and oversight of ethics is an ongoing and **dynamic process** that should be tailored to the specific ethical issues and risks associated with the research project. It is essential to **maintain open communication** within the consortium and with stakeholders and to respond promptly to any ethical concerns that may arise.

6 Conclusions

This document has addressed the main ethical aspects related to the ZeroF project, from the principles of Responsible Conduct of Research and the consortium's compliance with

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general ethical requirements and specific ethical dimensions relevant to the project to the ethics monitoring process.

All beneficiaries commit to complying with the set requirements, regulations, and processes. If any member of the consortium sees the need to update this document, they may contact the Coordinator who takes adequate actions.