water mining
value for society

Deliverable 1.5

Data Management Plan – 1st Update

Submission Date: 28 September 2022

Acknowledgements

Disclaimer

The information included herein is legal and true to the best possible knowledge of the authors, as it is the product of the utilization and synthesis of the referenced sources, for which the authors cannot be held accountable.

Keywords

▪ Data Management ▪ Data storage ▪ Data access ▪ Data sharing and reuse ▪ Data preservation ▪ Data privacy.

Deliverable information

Deliverable 1.5	Data Management Plan (1st Update)
Related Work Package	WP1
Deliverable lead	TU Delft
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Reviewer	Prof Patricia Osseweijer (TU Delft)
Grant Agreement Number	869474
Instrument	H2020 (Innovation Action)
Start date	1st September 2020
Duration	48 months
Type of Delivery (R, DEM, DEC, Other, ETHICS, ORDP)[1]	ORDP
Dissemination Level (PU, CO, EU-RES, EU-CON, EU-SEC)[2]	PU
Date last update	27 September 2022
Website	www.watermining.eu
Name of researcher(s) with roles	Dr. Dimitris Xevgenos, Innovation Manager

History of changes

History of Changes			
Version	Date	Description	Author(s)
0.1	10/09/2020	First document structure	Dr. Dimitris Xevgenos
0.2	22/08/2022	First draft of the deliverable	Dr. Dimitris Xevgenos
0.3	12/09/2022	Review	Prof Patricia Osseweijer
0.4	14/09/2022	Second draft shared with EB members	Dr. Dimitris Xevgenos
0.5	20/09/2022	Review	EB members
0.6	21/09/2022	Third draft presented to project consortium	Consortium partners
1.0	27/09/2022	Final version of the deliverable	Dr. Dimitris Xevgenos

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[1] **R**=Document, report; **DEM**=Demonstrator, pilot, prototype; **DEC**=website, patent fillings, videos, etc.; **OTHER**=other; **ETHICS**=Ethics requirement, **ORDP**=Open Research Data Pilot

[2] **PU**=Public; **CO**=Confidential, only for members of the consortium (including the Commission Services); **EU-RES** Classified Information: RESTREINT UE (Commission Decision 2005/444/EC); **EU-CON** Classified Information: CONFIDENTIEL UE (Commission Decision 2005/444/EC); **EU-SEC** Classified Information: SECRET UE (Commission Decision 2005/444/EC)

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Executive Summary

This deliverable comprises the fifth deliverable of Work Package 1 and it comprises the 1st update of the Data Management Plan (DMP) of the project. A final update of the DMP is foreseen in M39 (D1.6).

After providing an overview of the project (Section 1) and the objectives and scope of this deliverable (Section 2), the specific means of data collection per work package (WP) are presented in Section 3.

Then, data storage and backup using the system provided by 4TU.datacentre for Research Data and managed by a project manager from TU DELFT, as the main tools for storage and exchange of data, is presented in Section 4. As an update to the previous Data Management Plan, in October 2021 (M13) the Project Management Team decided to switch to another data storage platform called Quodari. The reasons are explained in Section 4.

Finally, this report deals with the data integrity; i.e. we describe how to deal with data documentation (Section 5), data access (Section 6), sharing and reuse (Section 7). With reference to the latter, and especially after the review meeting covering the 1st administration period, special attention is now paid to Open Access. This was particularly discussed within the third annual project meeting that was held in 18-21 September 2022 in Sicily.

Finally data preservation and privacy of participants in surveys and simulations are discussed in Section 8 and Section 9 respectively.

Deliverable 1.5 was originally due by M21 (May 2022). However the coordinator requested through the participants portal a postponement of the due date to M25 (September 2022). The reason for this change was to benefit from the consortium meeting that was carried out on 19-21 September in Sicily, where key insights (especially for the Open Data) were obtained and integrated in the current deliverable.

The Project Officer approved the postponement of the due date through the portal on 14 September 2022.

Table of Contents

List of Figures

List of Tables

Abbreviations

DMP	Data Management Plan
PMT	Project Management Team

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1 Introduction

WATER-MINING is a project funded by the European Commission (Horizon 2020 – Grant Agreement No 869474) with a total duration of 48 months (Start date: 01/09/2020 – 31/08/2024) and a total budget of approx € 19 million (EU Contribution: € 16,876,959.59). The project is entitled "Next generation water-smart management systems: large scale demonstrations for a circular economy and society" and it is a project granted under the call topic "CE-SC5-04-2019: Building a water-smart economy and society". Further information about all the sister projects funded under this topic can be found at the CORDIS website here. The WATER-MINING consortium comprises 38 partners from 12 countries, led by the Delft University of Technology (TU Delft). More information about the project can be found at the project website (https://watermining.eu) as well as the dedicated website at CORDIS database (https://cordis.europa.eu/project/id/869474), while an overview is provided below.

The WATER-MINING project aims to provide for real-world implementations of Water Framework Directive (and other water related legislation), as well as the Circular Economy and EU Green Deal packages by showcasing and validating innovative next generation water resource solutions at pre-commercial demonstration scale. These solutions combine WATER management services with the recovery of value-added renewable resources extracted/MINED from alternative water resources ("WATER-MINING").

The project integrates selected innovative technologies that have reached proof of concept levels under previous EU projects. The value-added end-products (water, platform chemicals, energy, nutrients, minerals) are expected to provide regional resource supplies to fuel economic developments within a growing demand for resource security. Different layouts for urban wastewater treatment and seawater desalination are proposed, to demonstrate the wider practical potential to replicate the philosophy of approach in widening circles of water and resource management schemes. Innovative service-based business models (such as chemical leasing) are being introduced to stimulate progressive forms of collaboration between public and private actors and access to private investments, as well as policy measures to make the proposed water solutions relevant and accessible for rolling out commercial projects in the future. The goal is to enable costs for the recovery of the resources to become distributed across the whole value chain in a fair way, promoting business incentives for investments from both suppliers and end-users along the value chain. The demonstration case studies are to be first implemented in five EU countries (NL, ES, CY, PT, IT) where prior successful technical and social steps have already been accomplished. The broader project consortium representation will be an enabler to transferring trans-disciplinary project know-how to the partner countries while motivating and inspiring relevant innovations throughout Europe.

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2 Scope of the deliverable

Within WATER-MINING project, Work Package 1 (WP1) is focusing on the "Project Management". WP1 is structured on the following five (5) Tasks:

- ❖ **Task 1.1**: Overall co-ordination / Project Management Team;
- ❖ **Task 1.2**: Establish communication flow and methods;
- ❖ **Task 1.3**: Data management;
- ❖ **Task 1.4**: Project risk management & Quality Assurance; and
- ❖ **Task 1.5**: Ethics.

The results from the implementation of this WP are presented through eight (8) deliverables:

- ❖ **Deliverable 1.1**: Project management guidelines (connected to Task 1.1 & Task 1.2);
- ❖ **Deliverable 1.2**: Data management plan (connected to Task 1.3);
- ❖ **Deliverable 1.3**: Scientific quality assurance plan (connected to Task 1.4);
- ❖ **Deliverable 1.4**: ETHICS (connected to Task 1.5);
- ❖ **Deliverable 1.5**: Data management plan (1st update) (M21)) (connected to Task 1.3);
- ❖ **Deliverable 1.6**: Data management plan (2nd and final update) (M39) (connected to Task 1.3);
- ❖ **Deliverable 1.7**: ETHICS (1st Update) (connected to Task 1.5); and
- ❖ **Deliverable 1.8**: ETHICS (2nd and final Update) (connected to Task 1.5).

The current deliverable comprises the fifth deliverable of WP1. The work was led by TU Delft within Tasks 1.3.

Data management is an important aspect of each project as it ensures long-term preservation and accessibility of data during the project and after the project has ended. The objectives of this deliverable are to describe how the data will be generated or used within WATER-MINING project, how they will be collected, managed, stored and made available during the project, and how they will be shared upon completion of the research project. In addition, the data management plan can reduce the risk of data loss or other threats that could render the data illegible or unusable (e.g. the obsolescence of software).

The management of the data produced during the project will ensure open access, as stipulated in Article 29.3 of the Grant Agreement. The consortium will continuously evaluate the different possible routes that can be used for scientific publications (see also Figure 2-1), which is either self-archiving (also referred to as "green" open access) or open access publishing (also referred to as "gold" open access).

On the other hand, the consortium will take also in consideration the "as open as possible, as closed as necessary" principle, to ensure that the project results that can be further exploited in the future commercially e.g. through patenting. Thus, the project will seek for a balance between openness and protection of information, commercialization and Intellectual Property Rights (IPR), privacy concerns,

security etc. In case project partners need to keep specific parts of their research data closed, the reasons for not giving access will be described explicitly in this data management plan.
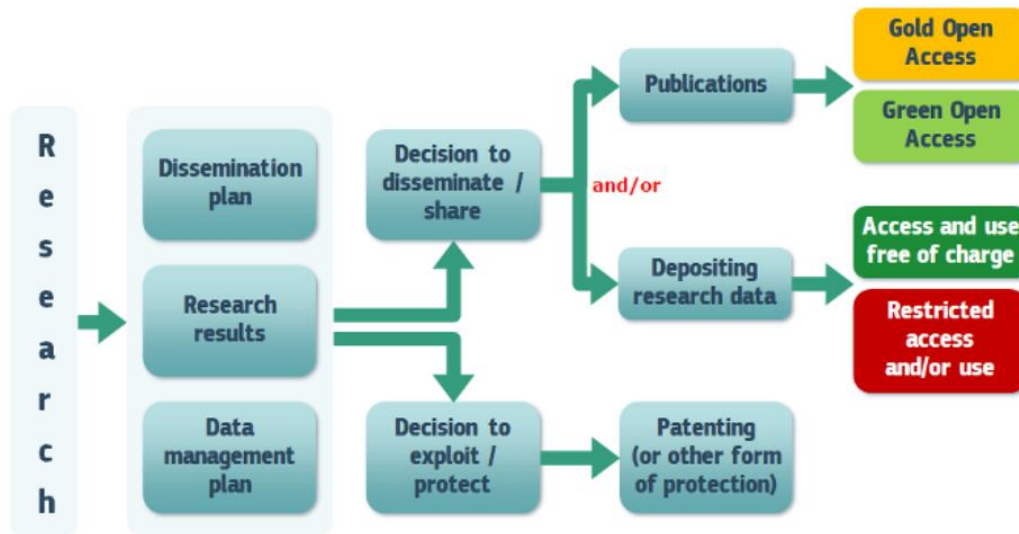
Figure 2-1: Different routes of management of data generated during WATER-MINING project

During the WATER-MINING project, various (big) data will be collected such as case studies, results from simulations and analysing samples, log data, etc. This deliverable is considered a dynamic document that will be updated over the course of the project. The DMP is updated twice within the project lifetime, the current deliverable being the first update and then by M39 (D1.6), differentiating the data that can be openly accessible from the project outcome (especially relevant for the demonstration activities of the project, WP2, WP3, WP4, WP5, as well as the market exploitation activities – WP8). The Innovation Manager will be responsible for coordinating the knowledge management activities, including data management.

3 Data collection

This section describes the methods of data collection for each work package as indicated by the work package leaders. For each work package, the following items are checked and described, as far as applicable.

Type of data
In WATER-MINING project, the following type of data will be documented:

- *Observational data*: this type of data will be captured real-time and, typically, cannot be reproduced exactly which makes the strategies applied for documentation of this type of data extra important. Therefore a careful and elaborated preparation of the way that data will be captured (instruments, calibration, conditions and observation method) is crucial before recording this type of data. Once this type of data is captured all subsequent steps (filtering, aggregation, processing, analysis and visualization) will be reproducible.

- *Experimental data*: this type of data will be achieved from the laboratory analysis or from equipment used. This type of data can be reproduced most of the time, but the reproduction may be expensive. Also, for this type of data, a thorough and elaborated preparation is needed before the capturing. The steps after the capturing are reproducible for this type of data.

- *Simulation data*: this type of data will be obtained from models. The reproducibility of this data is subjected to knowing the input, version control of the input and software code as well as information about running environment such as operating system, release date, software dependencies, etc.

- *Derived or compiled data*: this type of data will be obtained from data mining or statistical analysis. The reproducibility of this data is subjected to a good documentation of original data.

- *Metadata*: metadata are information about the data. The reproducibility of metadata depends on the availability of the original data that metadata give information about.

Data can also be classified in the following three (3) broad categories: (a) Input or "raw data"; (b) Processed or "research-ready" data; and (c) Output or "Publication-ready" data.

Version control
Versioning is important for long term-research data management where metadata and/or files are updated over time. For scientific projects in which different parties are involved, it is more efficient that the data storage system has a version control function to prevent losing of data. A version control system (or revision control system) is a system that tracks incremental versions (or revisions) of files and, in some cases, directories over time. Of course, merely tracking the various versions of a user's (or group of users') files and directories isn't very interesting in itself. What makes a version control system useful is the fact that it allows you to explore the changes which resulted in each of those versions.

4 Data storage and backup

Storage media and location

WATER-MINING involves collaboration with 38 partners and a large amount of data is being and will be generated. To manage such quantities of data and allow the partners (and other researchers) to share them with each other, suitable storage media should be used that comply with European privacy legislation.

The following storage media are NOT appropriate for storing the data generated in WATER-MINING project:

- Cloud storage, such as Dropbox and Google Drive,

 These are popular services used by general public and not appropriate for sensitive data storage. If cloud storage is used for storage of a part of data their service level agreements should be studied before using them;

- Local drives, cloud storage and external portable storage devices

 These are storage facilities that do not fall under surveillance of this data management plan. Local drives such as PCs and Laptops are convenient for short-term storage and data processing. However, relying on local drives for storing master copies should not be encouraged, unless backup of data is made through networked drives regularly; and

- External portable storage devices, such as external hard drives and USB drives,

 These are very common among individual researchers and students because they are convenient, cheap and portable. However, they are not recommended for long-term storage as their longevity is uncertain and they can be easily damaged or lost.

The consortium partners will deposit the data generated by the project in the data archive provided by the 4TU.Center for Research Data (4TU.ResearchData in short) belonging to TU Delft. A **Data Lab** will be established in order to store data generated during the project, to share this data with project partners, to process them and to visualise them. A data lab is a secure online environment (with or without screening) for storing, processing and sharing dynamic research data, digital tools and software, visualisations and other items with fellow researchers. DataverseNL is one of the possibilities offered for 4TU-ResearchData as a type of Data Lab. This data repository can be accessed here: https://data.4tu.nl/info/en/

DataverseNL (see also here)
DataverseNL is an open-source application that makes research data accessible to others. DataverseNL is specifically designed to store, back-up, organise, annotate and share research data with colleagues all over the world. This open-source application can grant multiple individuals controlled access to data. DataverseNL provides for the following:

- Organization of data files in dataverses and datasets

- Addition of metadata and documentation

- Version management

- Management of access rights

- Easy collaboration with fellow researchers or project partners, beyond university or research institute
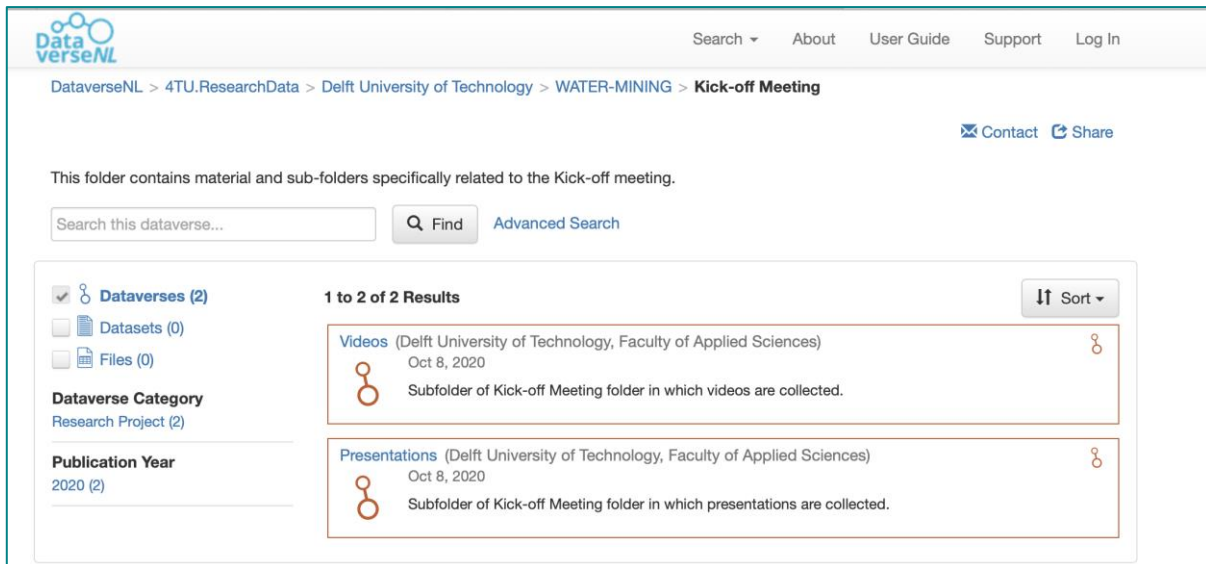
- Centralized professional storage and backup

Figure 4-1: View of WATER-MINING data storage page using DataverseNL (folder Kick-off Meeting)

Once a dataset is published, any metadata or file changes (e.g. by uploading a new file, changing file metadata, adding or editing metadata) will be tracked in DataverseNL versioning feature. The authorized users can view what has exactly changed starting from the originally published version to any subsequent published version. The DataverseNL uses git for version control and GitHub for hosting. Subversion is an alternative data storage system to DataverseNL.

Subversion repository hosts by TU DELFT:
Subversion (or shortly SVN) is a powerful open-source version control system that is typically used to manage the collections of files that make up software projects. However, a SVN repository may actually be used for managing any collection of files that are changed or modified over time. Conceptually, a SVN repository is similar to a folder or directory on your computer that may contain a collection of assorted, but related, files and directories. In fact, a SVN repository is typically used to store all the files and directories that make up a single project, or perhaps even a collection of interrelated projects. However, unlike a normal folder on your computer that stores only the most recent copy of a collection of files, a SVN repository also stores the history of those files.

SURFDrive is a storage medium that was used temporarily by WATER-MINING for storage and sharing of data management part of the project.

SURFDrive (see also here)
SURFdrive allows you to store, synchronise and exchange 500 GB of research data safely and easily with third parties. You have easy access to your data files from any device. SURFdrive complies with Dutch and European privacy legislation. The data is stored safely in the Netherlands and is never made available to third parties, which is a marked advantage over services like Dropbox.

Storage of data in WATER-MINING until M12:

DataverseNL comprises the storage system used in WATER-MINING project. In the table below the different data storage possibilities offered by TU Delft are presented.

Table 4-1: Comparing possibilities of data storage

Name	Subversion	DataverseNL	SurfDrive
Capacity storage	6 TB	100 GB/person	500 GB
Version control	Automatic	Automatic	
Permission control	Login by account holder and control by admin	Login by account holder and control by admin	Link sharing
User friendly	Learning steep	Yes	Yes
Synchronisation	Down and upload	Down and upload	Automatic
Special software	Yes	http based	Yes
Costs	Free	50 / year	Free
Archiving	Yes / 6 years	15 years /	Yes

Storage of data in WATER-MINING after M13:

WATER-MINING started with the university provided and secured platforms of Surfdrive but partners found this very unsatisfying due to complex structures and restricted uploading and sharing options. While TEAMS was suggested as alternative, this was not a save and approved option. Therefore we searched for an alternative that would be both user friendly and fit all criteria of secure and safe working from the partner perspectives. Quodari was thoroughly reviewed by the TUDELFT security team and was approved for use. WATER-MINING ensured a contract in which co-design for desirable adaptations was ensured. The package was introduced at the second Project Meeting and the Quodari team assisted all partners and especially WP leaders with the design and use of the platform. On 28 January 2022, European day of Privacy, Quodari received the Netherlands Privacy Award for their privacy friendly social media and data platform.

Back up location and frequency

The tables below provide the expected data storage and back-up location and frequency by Work Package.

Storage capacity needs for the 1st year of the project implementation

The storage capacity needs were collected from the Work Package leaders through questionnaires. The capacity needs are presented in the table below by WP, for the period (September 2020 – October 2021).

Table 4-2: Storage capacity needed (in MBs) for the period M25 – M36 by WP

Work Package	Storage capacity needed in MB
WP1	500
WP2	14,000
WP3	54,300
WP4	35,000
WP5	41,200
WP6	3,000
WP7	25,000
WP8	30,000
WP9	12,450
WP10	7,000
WP11	10,000
Total	**232,450**

5 Data documentation

This section describes how data will be documented to help new members of the team and future (secondary) users understand and reuse it. A simple file identification system is prepared to upload files to the selected system and to communicate on files amongst consortium/work package partners. The same identification system is used for files that are uploaded to the EU participants portal.

Below more information is provided regarding the type of documentation that will accompany the data to help secondary users to understand and reuse the data, as well as information regarding the identification of the data.

Meta-data

Along with the data files, metadata records will be produced to describe and contextualize the data. Both descriptive and substantive metadata will be produced:

✓ **Descriptive metadata** are indispensable for the preservation, retrieval and re-use of datasets. These provide answers to questions concerning the person creating the data, the subject of the data, the type of file, geographic information and other aspects. In other words, metadata are 'data about data'. Metadata make use of international standards for data exchange. This ensures that the information and the associated dataset can be found by search engines. The descriptive metadata that will be produced are listed in Table 5-1.

✓ **Substantive metadata** is important primarily for the user of the data. For example, consider a codebook that tells how the data should be read or interpreted. In many cases, such information is added in the form of Readme.txt files or similar descriptions

Table 5-1: Descriptive metadata that will be included in the documentation of WATER-MINING data

Item	Description
Creator*	Main researchers involved in producing the data.
Title*	Name or title by which the dataset is known.
Contributor	Institution where the data was created or collected. A person or organization responsible for making contributions to the dataset.
Publisher*	A holder of the data (including archives appropriate) or institution which submitted the work. Any others may be listed as contributors.
Publication year*	The year when the data was or will be made publicly available.
Date created*	Date the resource itself was put together; this could be a date range or a single date.
Description*	Concise description of the contents of the dataset. Describe the research objective, type of research, method of data collection and type of data.

Item	Description
Subject	Subject, keyword, or key phrase describing the resource.
Temporal coverage	Indicate the dates to which the data refer. Enter the year, or beginning and ending dates.
Spatial coverage	Describe the geographic area to which the data refer (e.g. municipality, town/city, region, country). The geographic coordinates of the area may be included, if desired.
Identifier	4TU.ResearchData automatically assigns a DOI to a dataset once the entire deposit procedure has been completed. In some cases, a dataset may be known by one or more other (persistent) identifiers.
Language*	The primary language of the resource. When no language is added, 4TU.ResearchData will automatically assign 'English'.
Link to publication	Include the web addresses or DOIs for any publication, important internal reports or other datasets that are related to your dataset.

File naming & Identifiers

In WATER-MINING project, an identifier is used as a reference number or name for a data object and forms the key part of our documentation and metadata. Table 5-2 shows the codes that can be used for making identifiers, including also some identifier as examples to the codes mentined in Table 5-1.

Table 5-2: Codes for identification of files

	Deliverables	Meetings	Conferences
First letters	WATER-MINING	WATER-MINING	WATER-MINING
Underscore	_	_	_
Next letters	Deliverable number [Dx.y] [x=WP number, y=deliverable number]	Type of document (i.e. Agenda, Minutes, Presentation) In case of presentation, include WP number.	Event title
Underscore	_	_	_
Next letters	Short explanatory **title** for the document.	**Date** and **location** of the meeting	**Date** and **location** of the meeting
Underscore	_		
Next letters (for presentations only)		Short name of **organisation** and **Initials** of presenter	Short name of **organisation** and **Initials** of presenter
Underscore		_	_
Next letters	"v" and number of revision of this specific report [v0.1=draft version, v1.0=final version]	"v" and number of revision of this specific report [v0.1=draft version, v1.0=final version]	"v" and number of revision of this specific report [v0.1=draft version, v1.0=final version]

In addition to the standard identification system provided and used by WATER-MINING project, more options are available for documentation of public files:

- The project deliverables that are indicated as public regarding the dissemination level in the Grant Agreement (Code: PU), will have the same system identification as uploaded files through the EU participants portal

- In the case of presentations and publications on conferences or other public media used for dissemination, the identification system of the organisers of the event or the medium that is publishing will be followed.

- In some cases, the University will also publish the data to make retrieval for potential users even easier. In this case, the University will use Digital Object Identifiers (DOIs) (see also below "Long-term data preservation").

- Public files are also available through the website made for WATER-MINING project and through the 4TU.Centre for Research Data.

Documentation may include details on the methodology used, analytical and procedural information, definitions of variables, vocabularies, units of measurement, any assumptions made, and the format and file type of the data by considering how this information is captured and where it is recorded.

Following good research practice rules, data documentation will be added as a Readme.txt file (a plain text file) to the folder where the corresponding datasets are saved.

Long-term data preservation

To be useful over the long-term, identifiers are made unique through including the preface WM and persistent to not being changed over time. The emerging identifier standard for publicly available datasets is the Digital Object Identifier (DOI). 4TU.ResearchData will automatically assign a DOI to a dataset that allow easy citation and discoverability.

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6 Data access

Large quantities of digital data will be generated and analyzed in all work packages by the project partners. This section describes the authorized access to the data, which is collected and managed during the research. In general results are owned by the party that generates them. In the cases that data are generated by two or more parties, the data ownership is jointly shared among consortium partners. Commercial exploitation of data is not yet discussed but procedures are foreseen and agreed upon within the Grant and Consortium Agreements.

6.1 Copyright and Intellectual Property Rights issues

Intellectual property generated within the WATER-MINING project will be protected by patents, if appropriate, and its management will be regulated in compliance with the final consortium agreement and the intellectual property agreement among the partners.

Three levels are considered for the copyright and foreground intellectual property that will be created in the course of the project.

- Individual and joint intellectual property, which belongs to individual partners or is jointly owned by partners working in a particular task and is restricted to those partners. The appropriate and ethical process in line with owner guidelines and (National) Standards be will be followed in the case of individual and joint intellectual property.

- Generic intellectual property, which can be used by all partners of the consortium. Some of the generic intellectual property will be made more widely available to European academics, SMEs and other industrial organizations. To prepare for the deployment and exploitation of the project results, the Innovation Manager will constantly monitor the progress of the research, as well as the advances outside the Consortium with support of the Executive Board and the Intellectual Property Use and Dissemination Committee (IPUDC), for an early monitoring of Foreground knowledge which should be protected, and for a continuous updating of the research/work programme to improve project effectiveness. The IPUDC has the task to extract the generic knowledge of foreground IP. Any revisions to this consortium agreement will be made through discussions within the General Assembly of WATER-MINING project.

- Publicly available intellectual property includes data that will be made available with no restrictions for instance documents that will be published at conferences or data that will be made available on the public website. The IPUDC shall identify which data can be made publicly available. Any revisions to this consortium agreement will be made through discussions within the General Assembly of WATER-MINING project.

6.2 Limitations on the access to data

Confidential data will be stored in the secure facilities of the organisation responsible for collecting the data and will be retained for a couple of years after the end of project (at least 5 years or longer) if required by individual institutions. A second person will be nominated to maintain study records if the responsible researcher is no longer able to do it.

If requested, data can be shared with other consortium members through the online repository of DataserveNL. The participants' names will be replaced with ID codes, for all personal data reported in the project, to maintain anonymity. Unless specific permission is provided, the participants' identity will be fully masked in any printed materials, project reports or dissemination materials.

The responsibilities of audio and video recording devices used within WATER-MINING studies will be with the individual members of the research team; i.e. no one outside of the research team will have access to any of these data. Consent should be provided when personal media and other content will be used in the wider dissemination of the research project. Audio files and other media will be deleted from digital recorders and stored digitally within a password-protected folder on the network drives of the participating institutions after transcription. Other content will also be stored in password protected databases within institutions, available only to members of the research team. Public data such as deliverables of WATER-MINING will have no limitations in publication and usage.

6.3 Data access control

Access control to information is the responsibility of the individual organisations involved in conducting the data collection studies. With regard to the personal data, only anonymised data is allowed to be placed on the selected platform (DataverseNL). The raw confidential data will be securely stored by individual organisations.

In Section 9, extra information will be provided with regard to the privacy of participants because a part of data in WATER-MINING is disseminated to the wider public through deliverables, internal reports, scientific journals, conferences, articles, workshops, publications, website and social media etc.

6.4 User access

The used system for data storage and data sharing requires the manual activation of a new account from one of the administrators. This enables full control of the users accessing the WATER-MINING project in either of the used systems and ensures the correct access for each user. In the beginning, the PMT and work package leaders will be added to the platform. The project coordination and innovation manager decide who could have access to data and which data can be accessed by each user. The platform administrator (Dr. Amalia Kallergi) is responsible for ad hoc adding and removing users, and adjusting the access level of users on the request of the members of the management team. Access of new users to data will be applied through the work package leaders, endorsed by the project coordinator and innovation manger and done by the platform administrator.

7 Data sharing and reuse

The consortium partners are the main user of data in WATER-MINING project. This data will be used to support the design, development and assessment of innovations in WATER-MINING project. In addition to the consortium partners, other stakeholders (salt producers, water and wastewater purification technology suppliers, engineering agencies, etc.) may express their interest in reusing the data during or after the project to support further research projects or products and services. In the case of public data such as deliverables, the data reuse procedure is not complicated; the information is public. In other cases, assessments will be done about the aims pursued by the stakeholder with the data and about the role of the applicant stakeholder in the data collection.

Sharing and reuse of confidential data such as commercial or sensitive data is not possible. In case that the dataset cannot be shared, the reasons for this should be mentioned (e.g. ethical, rules of personal data, intellectual property, commercial, privacy-related, security-related).

With reference to Open Data, and further to the letter received by the European Commission dated 24th of May 2022 (Ref. Ares(2022)3914903), the project consortium discussed what type of datasets can be made open and included also under the SyGMa platform of the project (see also figure below).

Within the 3rd Project Meeting held in Sicily between 19-21 September 2022, the Innovation Manager organized one "Data Management" and one "Innovation Management" workshop, aiming at facilitating the maximization of the dissemination and exploitation possibilities, following the "as open as possible, as closed as necessary" principle. During the "Data Management" workshop held on 19 September 2022, the following decisions were made regarding the datasets that can be made open

- **WP1**: No research data are expected to be generated, with the exception of some questionnaires that may relate to the Ethics task. If this is the case, these questionnaires will be made public, paying special attention to anonymization according to GDPR rules;
- **WP11**: Dissemination & Communication activities. No research data are expected to be generated;
- **Technical/demonstration Work Packages**: WP3, WP4, WP5, WP6. The leaders of the technical Work Packages, as well as the partners (mostly technology suppliers/SMEs) of these WPs agreed that some datasets can be made open, especially the datasets that refer to the results that have already been used to produce publications. From WP3, partners experienced with open data sharing (UNIPA) mentioned also about the possibility to use Zalado as a platform. The Innovation Manager also managed the possibility of using the TU Delft platform called dataverse.nl – a platform where a DOI can also be assigned per dataset (see also Sections 4, 6.3, 8);
- **Horizontal Work Packages**: WP2, WP7, WP8, WP9, WP10. For all the horizontal work packages, the partners discussed that dataseries will be generated, but this will be at a later stage of the project implementation. This part will be discussed in the next update of the Data Management Plan. Special reference was made to the data (photo/video material) that is

being generated within WP8 as a result of the marine diving surveys. Discussions are now in progress about the possibility to share selected material from these diving surveys.

Open Data

☐ This project does not currently have any Open Dataset

Open Datasets suggested by OpenAIRE (0 datasets pending)

There are no Datasets

Project Open Datasets (0 datasets)

There are no Datasets

Figure 7-1: Open Data as illustrated in the SyGMa platform of the WATER-MINING project

8 Data preservation and archiving

Criteria for preservation and long-term access

All relevant obtained data will be preserved and archived on the DataverseNL platform, the network of the researcher institute and on the network drive of the Technical University of Delft during the project and on the network drive of researcher institute and the Technical University of Delft for at least 5 years after the termination of the WATER-MINING project.

The consortium partners decide which data has to be archived for preservation and long-term access during the implementation course of the project. Experts suggest that all data should be kept in secured storage at least for 5 years or longer after the end of the project. In the cases that audio and video recording devices are used within WATER-MINING project the media will be deleted from digital recorders and stored digitally within a password-protected folder on the network drives of the participating institutions after transcription of the data. Exceptions are when consent is specifically provided. In the case of staff changes and illness, it is possible to access data by a second responsible person. The second person is not yet determined in the WATER-MINING and the Project Management Team explores the possibilities.

Data formats chosen for long-time preservation

The consortium partners are still discussing this aspect. For the long-term data preservation and availability, the data will be preserved in the pdf format for which software is widely available on a variety of platforms. When data consists of many files, zip bundles will be used to group this data; thus making uploading and downloading easier.

Data repository for archiving WATER-MINING data

4TU.Centre for Research Data.

4TU.ResearchData is a repository for technical-scientific research data that stores the data in a permanent and sustainable manner, according to the guidelines of the international Data Seal of Approval. Being a Trusted Digital Repository, 4TU.ResearchData is taking appropriate measures to ensure the long-term availability and quality of data it holds.

Once a dataset has been completed and 'frozen', it may be transfered to 4TU.ResearchData archived for long-term storage (at least 15 years). Before uploading, the data should be finalised because it cannot be altered or supplemented by additional information. Any changes or supplements to data will be accepted as a newly uploaded version. 4TU.ResearchData will make a link between the new and previous version. By default, this data will be available via Open Access and be stored for a minimum of 15 years. It can also be extended for periods of 15 years at the cost rates indicated below. The data is stored in three different locations to ensure its safety. In principle, the data will then be made public, while a new version of the website at 4TU.ResearchData website is currently being developed, in which limited access possibilities will also be provided. More information will be provided at later stages of the project implementation. It is possible that the data or a part of it cannot be released.

The project consortium has created a repository called "WATER-MINING". This repository has a unique Digital Object Identifier (DOI), where the research data that are generated during the project and selected to be made publically available, will be uploaded.

Costs for archiving data

TU Delft provides the possibility to store and archive 100 GB by year for each staff member that is being involved in WATER-MINING project. This means that 12,000 GB can be stored for free each year in the identified repository, while for archiving more data the cost is € 4.50 per GB. By default, this data is stored for a minimum of 15 years, while it can also be extended for periods of 15 years at the same rate.

For more information about the preservation policy of TU Delft, you may refer to this document: https://researchdata.4tu.nl/fileadmin/user_upload/Documenten/4TU.Preservation_Policy.pdf

9 Privacy of participants

The privacy of participants during and after the WATER-MINING project should be guaranteed and safeguarded at all time during and after the project. The participants will not be providing sensitive personal data about their own lifestyle or beliefs. To this aim, the lines of the EU Data Protection Directives will be adopted. Deliverable 1.4 (ETHICS requirements) provide guidelines for the participants' privacy. Therefore, all participants' information should be anonymised before storing and archiving.

9.1 Responsibility of partners in WATER-MINING

The partners involved in the WATER-MINING project recognize that gathering empirical data and evidence from participants entails significant responsibilities for them, such as the conditions mentioned in the ETHICS report (D1.4).
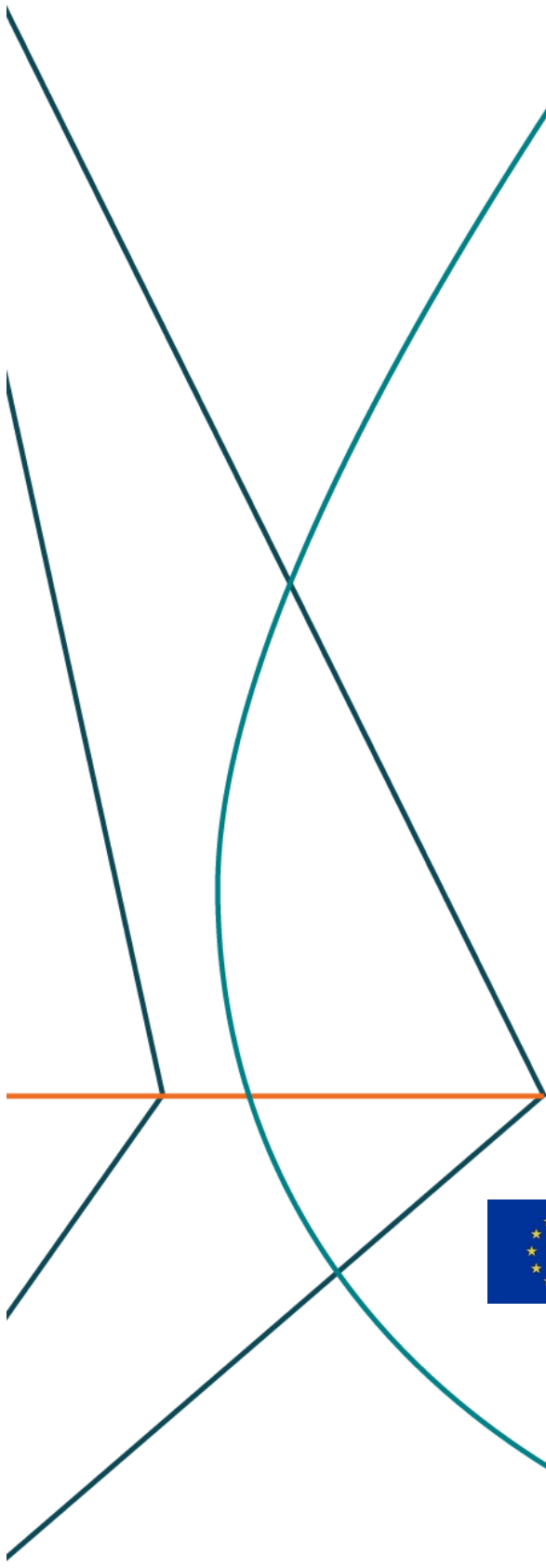
9.2 Governance

The following governance measures will be applied to ensure the compliance with all aforementioned data management decisions. WP leaders are responsible for adhering to the above specifications for their respective work package. For the overall project, TU DELFT will be responsible for complying with the data management plan. All consortium partners are responsible for making sure personnel working on the project have read the data management plan and adopted the principles.

9.3 Any other business

Changes in the Data Management Plan cannot overrule the principles that guide the Plan, such as the integrity rules of TU DELFT. To evaluate the efficiency and efficacy of the data management plan, it will be revised on a yearly basis. The evaluation will at least include:

- Do data sufficiently preserve the anonymity?
- Is the anonymization carried out correctly and issued with unique identifier?
- Is the confidential and sensitive data being stored safely in the database?
- Is file identification carried out correctly and meaningful (i.e. labels)
- Is the file identifier understandable for outsiders?
- Is the plan still consistent with what is being done in WPs?
- Is the instantiated database consistent with the specifications in this document?

In any case, it must be mentioned that any anonymized / pseudonymised data that cannot be cross-linked and contains no further identifiable variables will be regarded as free to be used as 'regular' data.