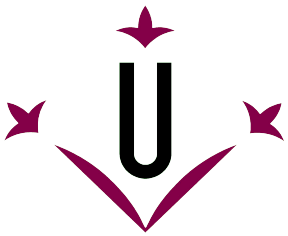

Universitat de Lleida
Escola Politècnica Superior

Quality Management and Improvement

Activity B: *Quality plan*

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Degree in Computer Engineering

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1 Introduction

This document will explain what a *quality plan* is. In order to explain this concept is essential to know that *quality plan* is part from *quality management system (QMS)* which is a collection of business processes focused on consistently meeting customer requirements and enhancing their satisfaction.

Quality plan provide a means of relating specific requirements of the process, product, service, project or contract to work methods and practices.

Everything that will be explained in this document is based on the quality management principles described in ISO 9000 and the concepts used in ISO 9001 for the establishment of *quality management system*.

Thereby, this document will define what a quality plan is, its objectives, its content and how it should be structured to finally see a real example.

2 Quality Management System

To understand what a *quality plan* is, first is necessary to establish a context where this plan is developed.

It is developed inside the *quality management system* often called a *QMS*, is a set of internal rules that are defined by a collection of policies, processes, documented procedures, and records. This system defines how a company will achieve the creation and delivery of the products and services they provide to their customers. The *QMS* needs to be specific for the product or service the company will provide so it is adjust in function on each company. However, some general guidelines exist in the form of *ISO 9001:2015 (Quality Management System - Requirements)*, which are intended to help standardize how a *QMS* is designed.[1] Below are detailed what this *quality management system* consists of.

2.1 Benefits

The benefits to an organization of implementing a *quality management system* based *ISO 9001:2015(en) Quality management systems - Requirements* are:

- The ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements.
- Facilitating opportunities to enhance customer satisfaction.
- Addressing risks and opportunities associated with its context and objectives.
- The ability to demonstrate conformity to specified quality management system requirements.[2]

2.2 Principles

The quality management principles are:

- Customer focus: consist to meet customer requirements and to strive to exceed customer expectations.

- Leadership: leaders at all levels establish unity of purpose and direction and create conditions in which people are engaged in achieving the organization's quality objectives.
- Engagement of people: involve people at all levels throughout the organization are essential to enhance its capability to create and deliver value.
- Process approach: the results are achieved more effectively and efficiently when activities are understood and managed as interrelated processes that function as a coherent system.
- Improvement: successful organizations have an ongoing focus on improvement.
- Evidence-based decision making: decisions based on the analysis and evaluation of data and information are more likely to produce desired results.
- Relationship management: an organization manages its relationships with interested parties.[3]

Figure 1: Quality Management Principles.

3 What is a quality plan

Planning is the process of thinking about and organising the activities required to achieve a desired goal. It combines forecasting with preparation for scenarios, and how to react to them.

A *quality plan* is a document, or several documents, that together specify quality standards, practices, resources, specifications, and the sequence of activities relevant to a particular product, service, project, or contract.[4]

A *quality plan* describe how business plans should be realised so that the organisation meets the needs and expectations of its customers and stakeholders, complies with legal and organisational requirements and continually improves the effectiveness and efficiency of its capabilities.

Incorporating quality into the activities of an organisation increases credibility and accountability and builds trust among its stakeholders.

This plan is strongly associated with the management of resources within an organisation, as resources are often limited and careful consideration is needed to define goals and find and allocate sufficient resource for realisation of the objectives.

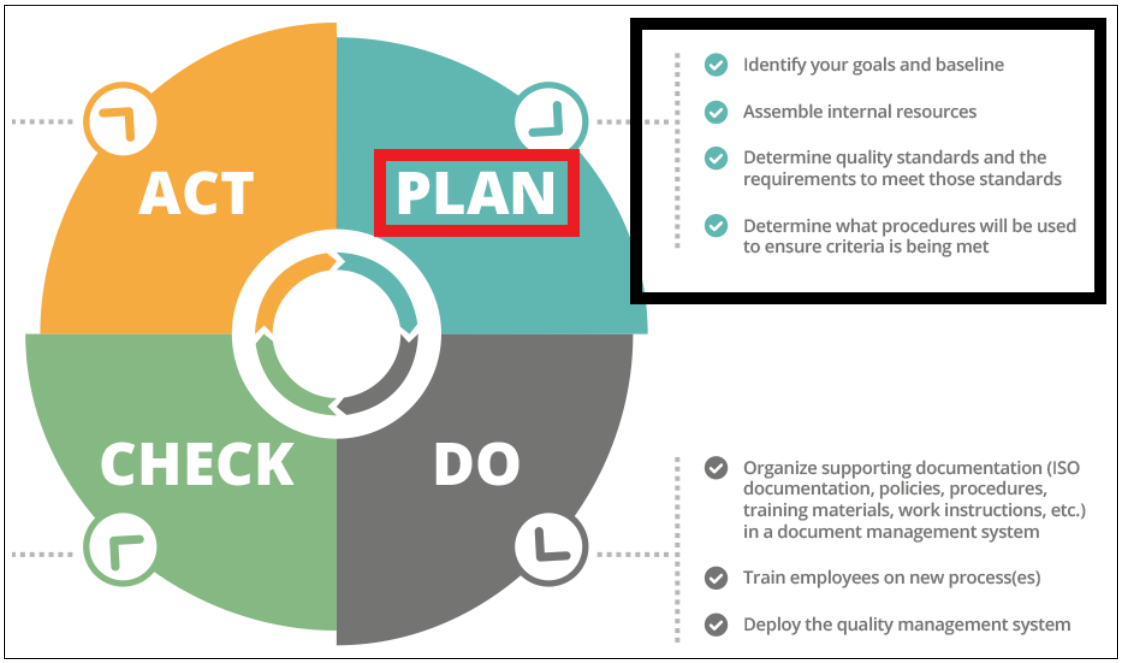


Figure 2: Quality plan.

3.1 Quality assurance

Quality assurance (QA) is a way of preventing mistakes and defects in manufactured products and avoiding problems when delivering products or services to customers; which ISO 9000 defines as "part of quality management focused on providing confidence that quality requirements will be fulfilled".[6] Through audits and other forms of assessment, quality assurance efforts detect and correct problems or variances that fall outside established standards or requirements.

In other words, quality assurance ensures a high level of quality during the development of products or services.

Most businesses utilize some form of quality assurance in production, from manufacturers of consumer packaged goods to software development companies. Some companies may even establish a quality assurance department with employees that focus solely on quality assurance.

3.2 Quality control

Quality control (QC) is a procedure or set of procedures intended to ensure that a manufactured product or performed service adheres to a defined set of quality criteria or meets the requirements of the client or customer. ISO 9000 defines quality control as "A part of quality management focused on fulfilling quality requirements".

QC is similar to, but not identical with, quality assurance (QA). While QA refers to the confirmation that specified requirements have been met by a product or service, QC refers to the actual inspection of these elements.

3.3 Quality management

Quality management (QM) is the act of overseeing all activities and tasks that must be accomplished to maintain a desired level of excellence. This includes the determination of a quality policy, creating and implementing quality planning and assurance, and quality control and quality improvement.

- Quality management is the act of overseeing all activities and tasks needed to maintain a desired level of excellence.
- Quality management includes the determination of a quality policy, creating and implementing quality planning and assurance, and quality control and quality improvement.
- QM requires that all stakeholders in a business work together to improve processes, products, services and the culture of the company itself.[9]

Figure 3: Quality System, Quality Assurance and Quality Control relationships.

4 The quality planning process

Quality management system can be conceived as a cycle which is the basis of corrective action as well as continuous improvement. The methodology called *PDCA cycle* can be applied to all processes and the system as a whole (dynamic cycle). The cycle starts with planning activities.

4.1 PDCA

PDCA (plan–do–check–act) is an iterative four-step management method used in business for the control and continuous improvement of processes and products.

The *PDCA cycle* can be applied to all processes and to the *quality management system* as a whole.

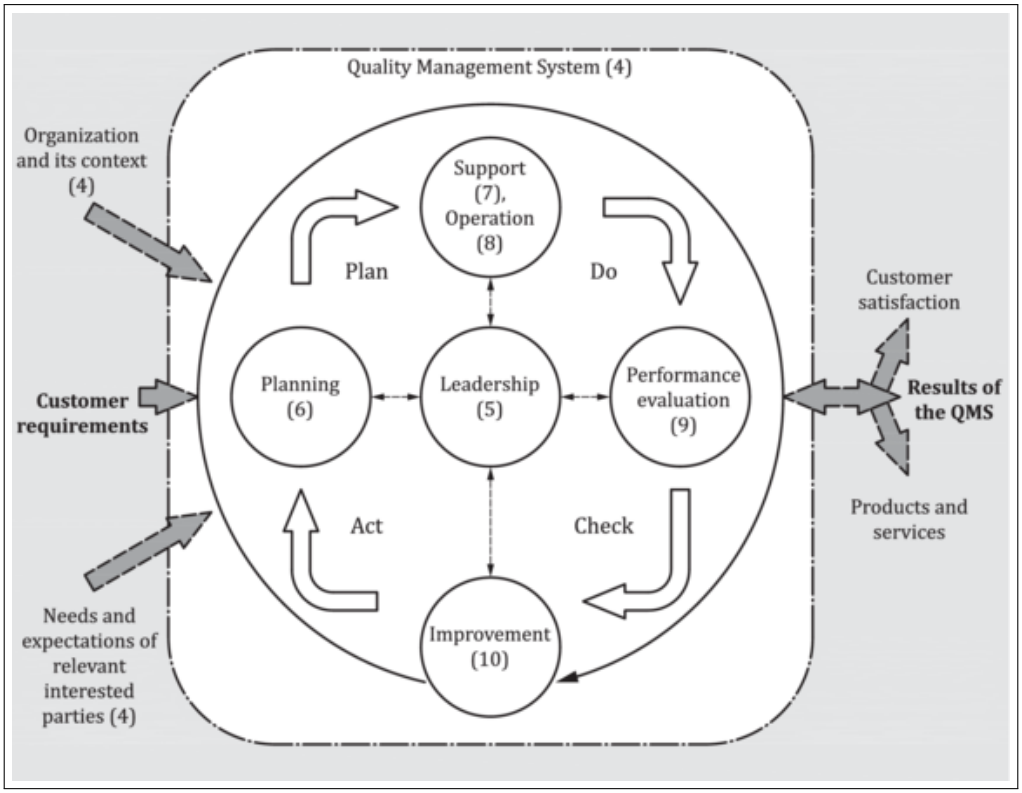


Figure 4: Representation of the structure of this International Standard in the *PDCA cycle*.

The *PDCA cycle* can be briefly described as follows:

- Plan: establish the objectives of the system and its processes, and the resources needed to deliver results in accordance with customers' requirements and the organization's policies, and identify and address risks and opportunities.
- Do: implement what was planned from the previous step.
- Check: monitor and measure processes and the resulting products and services against policies, objectives, requirements and planned activities, and report the results.

- Act: take actions to improve performance, as necessary.[2]

5 The objectives of a quality plan

Objectives are crucial to the planning process, as they represent the goals to be achieved in a measurable format.

A *quality objective* is a specified level of quality that must be met by a product, process, service or any project outcome, to be considered acceptable. It should provide information on:

- Conformity to legal obligations or organisational requirements.
- Fulfilment of customer's needs and expectations.
- The effective and efficient operation of a system or process or implementation of a project.

Objectives are set at various functional levels (strategic, tactical or operational, e.g. organisation, departments, processes, individuals) and should be documented.

At the organisation level, quality planning addresses development, maintenance and improvement of the overall *QMS*. At lower levels, quality plans set specific procedural quality objectives and the quality assurance and control activities to be performed in day-to-day operations. During the realisation of plans, they are transformed from documents to records.

The initial intention of the *quality plan* was to demonstrate how the *QMS* is applied to a specific case. It was also used to meet statutory, regulatory and customer requirements, to optimize use of resources in meeting quality objectives, to minimize the risk of nonconforming to the requirements and many other purposes.

A *quality plan* describes how an organisation will achieve its *quality objectives*. Plans are documented outcomes of the planning process at a given point of time. To maintain flexibility, planning should be an ongoing, active process and plans should be evaluated on a regular basis for continuing suitability and updated as necessary.

Quality plans should define:

- Objectives to be attained.
- Steps in the processes that constitute the operating practice or procedures of the organization.
- Allocation of responsibilities, authority, and resources during the different phases of the process or project.
- Specific documented standards, practices, procedures, and instructions to be applied.
- Suitable testing, inspection, examination, and audit programs at appropriate stages.
- A documented procedure for changes and modifications to a quality plan as a process is improved.

- A method for measuring the achievement of the quality objectives.

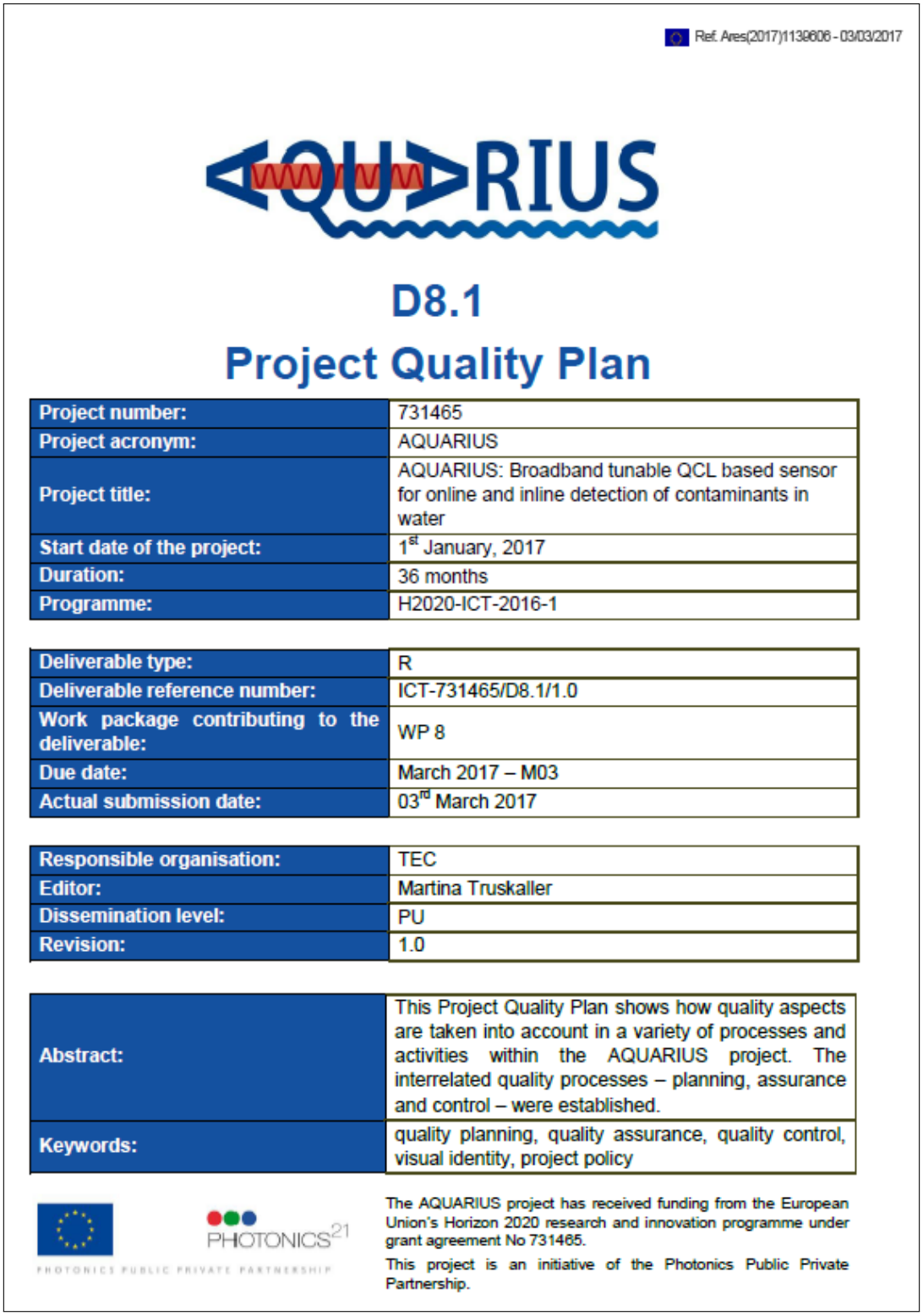
6 The content of a quality plan

In the following list, examples are provided on what things should be included in a quality plan:

- Quality objectives and indicators, method and frequency of data collection and method of evaluation of indicators including acceptance and rejection criteria.
- Process steps: inputs, outputs, value adding or conversion activities, sequence of steps.
- Nature, method, frequency and timing of interaction with other processes and where this interaction will occur.
- Process owner, responsibilities and accountabilities.
- Resources needed (facilities, equipment, human, materials, time, financial, etc.).
- Process controls: controls to detect and manage any non-conformities (audits, management review).
- Schedule (the timeframe in which the work will be achieved together with major milestones).
- Methods to monitor, analyse and address risks and opportunities (what could go wrong together with strategies for risk reduction and deployment of opportunities).
- An overview or introduction of the project or process detailing the background, need, scope, activities, and important dates or deadlines.
- The organizational structure or org chart detailing necessary team members, including external vendors.
- Each team member's responsibilities and qualifications necessary to fulfill stated duties.
- Work verification (e.g., who is responsible for carrying out a task, as well as who is responsible for checking the work).
- Testing parameters.
- Performance standards and how performance will be documented.
- A feedback mechanism for internal and/or external customer feedback.
- Quality control procedures.
- Deliverables.

7 Annex

7.1 Example of *quality plan*



Ref. Ares(2017)1139606 - 03/03/2017

AQUARIUS

D8.1

Project Quality Plan

Project number:	731465
Project acronym:	AQUARIUS
Project title:	AQUARIUS: Broadband tunable QCL based sensor for online and inline detection of contaminants in water
Start date of the project:	1st January, 2017
Duration:	36 months
Programme:	H2020-ICT-2016-1

Deliverable type:	R
Deliverable reference number:	ICT-731465/D8.1/1.0
Work package contributing to the deliverable:	WP 8
Due date:	March 2017 – M03
Actual submission date:	03rd March 2017

Responsible organisation:	TEC
Editor:	Martina Truskaller
Dissemination level:	PU
Revision:	1.0

Abstract:	This Project Quality Plan shows how quality aspects are taken into account in a variety of processes and activities within the AQUARIUS project. The interrelated quality processes – planning, assurance and control – were established.
Keywords:	quality planning, quality assurance, quality control, visual identity, project policy

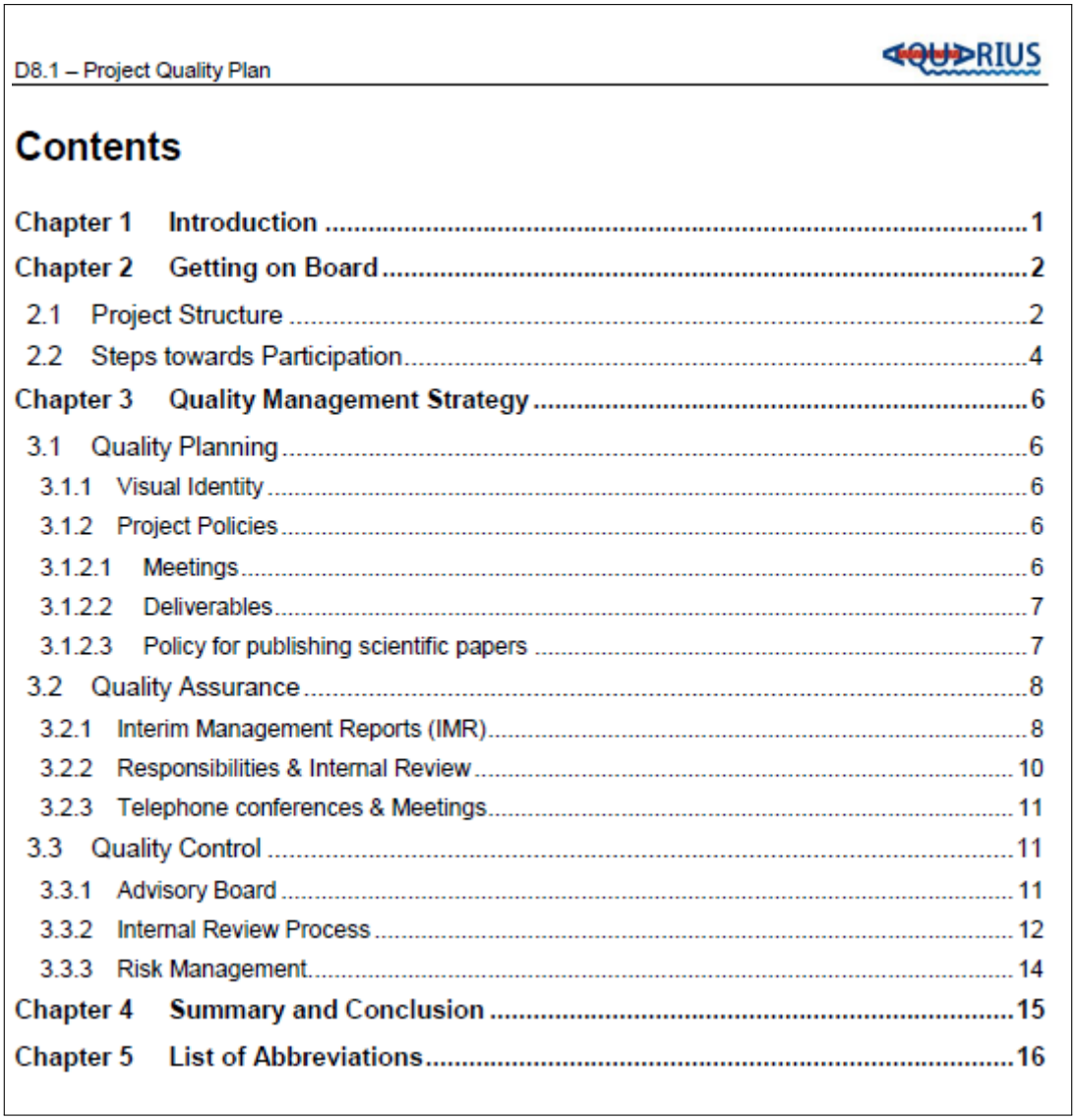
PHOTONICS21

PHOTONICS PUBLIC PRIVATE PARTNERSHIP

The AQUARIUS project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731465.

This project is an initiative of the Photonics Public Private Partnership.

Figure 5: *AQUARIUS: Broadband tunable QCL based sensor for online and inlinedetection of contaminants in water* project cover.



D8.1 – Project Quality Plan

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Figure 6: *AQUARIUS: Broadband tunable QCL based sensor for online and inlinedetection of contaminants in water* index.

Review Form
for the Internal Reviewer
AQUARIUS deliverable:

* Type of comments: **M** = Major comment, **m** = minor comment, **a** = advice

Date of Internal Review:	Internal Reviewer:		
	Answer	Comments	Type*
1. Is the deliverable in accordance with			
i. the Description of Action? https://aquarius.technikon.com/02-Legal-Documents/02-DoA/	☐ Yes ☐ No		☐ M ☒ m ☐ a
ii. the international State-of-the-Art?	☐ Yes ☐ No		☐ M ☐ m ☐ a
2. Is the quality of the deliverable such			
i. that it can be sent to the EC?	☐ Yes ☐ No		☐ M ☐ m ☐ a
ii. that it needs further editing?	☐ Yes ☐ No		☐ M ☐ m ☐ a
iii. that the content needs to be improved?	☐ Yes ☐ No		☐ M ☐ m ☐ a
3. Does the Deliverable include			
i. a clear structure (e.g. appropriate, understandable presentation of the work performed)	☐ Yes ☐ No		☐ M ☐ m ☐ a
ii. a sufficient and meaningful executive summary	☐ Yes ☐ No		☐ M ☐ m ☐ a
iii. an appropriate introduction	☐ Yes ☐ No		☐ M ☐ m ☐ a
iv. a meaningful summary & conclusion	☐ Yes ☐ No		☐ M ☐ m ☐ a

Figure 5: Internal Review Form

Figure 7: *AQUARIUS: Broadband tunable QCL based sensor for online and inlinedetection of contaminants in water* review form.

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Melinda Pálfi.