GEOLOGICAL SURVEY OF ESTONIA

Interreg Programme VI-A – Estonia-Latvia
Toiv.Joul@estlat.eu
Sõbra 56
50106 Tartu

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Response to Interreg Programme VI-A – Estonia-Latvia Monitoring Committee decision about project application HydroScope

Dear Tõiv Jõul,

On behalf of the Lead Partner (Geological Survey of Estonia), we hereby submit our formal response to the specific conditions set by the Monitoring Committee for the project HydroScope (EE-LV00250), as outlined in Annex 1 of the selection decision.

Below, we list each condition along with our detailed reply.

1. Please explain whether and how the planned activities described under Activity 2.5 are linked to the defined output indicators. If those activities do not contribute to and support directly the planned jointly developed solutions, they must be removed from the application form and the budget reduced accordingly. In the latter case, please also review the related aspects of Activity 2.4 and either provide justification for keeping them or remove them from the application.

The activities under Activity 2.5 are directly linked to the output indicators and are necessary for delivering the jointly developed solution, the real-time decision-making system.

Monitoring springs requires that the spring sites reflect natural groundwater conditions. If a spring is affected by litter, bank erosion, uncontrolled water extraction, or surface runoff directly into the spring, the monitoring data becomes unreliable since it is unclear whether detected pollution originates from the groundwater itself or is introduced from surface sources, which may not reflect the actual condition of the aquifer. This would compromise the accuracy of the early warning system. Cleaning, installing protective measures, and maintaining the spring sites are essential for ensuring that the data reflects groundwater quality, not surface-level disturbances.

Small-scale pilot measures are equally necessary for ensuring the longevity of the developed solution, as they are a critical part of testing and demonstrating how the platform supports real-time decision-making. When the early warning system flags an issue, municipalities can implement mitigation actions and use the platform to evaluate whether those measures are effective. By using preliminary monitoring results and carrying out small-scale pilot activities aimed at improving spring groundwater quality and protecting groundwater-dependent ecosystems around spring sites during the project, municipalities gain their first practical experience with what to do and how to do it. In the HydroScope project, it is very important to us that the main users of the early warning platform are also equipped with the necessary experience and knowledge to take action when pollution occurs or when ecosystem health is at risk.

Activity 2.4 and 2.5 are directly connected. The guidelines and thresholds developed under 2.4 are applied in 2.5 as hands-on pilot actions with municipalities. Without these activities, the monitoring system cannot function reliably or deliver accurate results. For this reason, the activities under Activity 2.5 (as well as 2.4) are fully in line with the output indicators and directly support the jointly developed solution.

2. Please address the inconsistency between Output 1.1 and Activity 1.4 by clarifying whether a single unified early warning platform will be developed for both countries or if a separate platform is planned for Estonia and Latvia. Please ensure a consistent description throughout the application form.

A single, jointly developed early warning system will be created for both countries. This system will be deployed through two separate web platforms, one for Estonia and one for Latvia, to ensure that municipalities and stakeholders in each country have access to locally relevant data through familiar national portals.

This approach is technically and practically justified. Hosting the platforms within existing national environmental GIS portals guarantees that groundwater data is easily accessible to the municipalities and other stakeholders who will use these platforms more regularly. It also ensures that the system remains functional and visible beyond the project lifetime without requiring the creation of an entirely new cross-border IT infrastructure, which would be significantly more costly and less sustainable.

It is important to emphasize that while there are two separate web platforms for practical deployment, they both visualize and operate on data generated from the same jointly developed early warning system. The cross-border collaborative process focuses on creating a shared solution for data collection, real-time monitoring and predictive modeling, while the user interfaces will be tailored to the needs, languages, and technical environments of each country. **In summary, the HydroScope project will develop one unified early warning system, delivered through two separate early warning platforms.**

3. Please explain how the two planned pilot actions are jointly developed between Estonian and Latvian partners.

The two pilot actions, (1) the deployment of real-time groundwater telemetry systems, and (2) the implementation of digital spring monitoring with pollution mitigation measures, are the result of a joint development process involving both Estonian and Latvian partners at every step. These actions are not separate initiatives carried out in parallel, but rather integrated, cross-border efforts designed collaboratively to address shared groundwater challenges and build a harmonized early warning system.

In the case of telemetry systems (developed under Activity 1.1 and implemented under Activity 2.1), LEGMC, with its existing telemetry experience, provides practical guidance to Estonian partners on procurement, technical options, installation, and maintenance. Input from Saaremaa and Dienvidkurzeme municipalities is used to define specific groundwater problems (e.g. drought sensitivity, contamination risks) and data needs. These local insights guide decisions about where and how telemetry systems should be installed.

The scientific partners also collaborate closely. UL evaluates what types of monitoring data are needed for machine learning models and defines data formats and resolution requirements (Activity 1.1). UT contributes to the design and site selection process in Estonia, ensuring sensors are placed where they can provide the most meaningful insights for tracking pollutant transport and aquifer conditions. GSE, as lead partner, facilitates and coordinates these technical discussions, making sure that all partners' perspectives are reflected in the decisions and that the outcome supports the development of a truly cross-border early warning system. National monitoring authorities (EEA in Estonia and LEGMC in

Latvia) make sure that the pilot monitoring sites align with and add value to national monitoring networks.

The digital spring monitoring systems and pollution mitigation measures are also jointly developed under Activity 2.2, Activity 2.4, and Activity 2.5. First, the two municipalities identify a list of potential spring sites. These are jointly assessed by GSE, UT, LEGMC, EEA, and UL, who contribute expertise on hydrogeology, monitoring infrastructure, national monitoring system compatibility, and data modelling needs. The final selection of digital spring systems takes into account ecological relevance, data requirements, and logistical feasibility, and is agreed upon collaboratively by all involved partners.

The design of mitigation measures (such as buffer zones, erosion control features, or protective installations) is based on jointly developed guidelines and thresholds produced by UT under Activity 2.4, with scientific coordination from GSE and input from EEA and LEGMC to ensure national relevance. These guidelines are rooted in the ecological and hydrogeological analysis carried out jointly earlier in the project (Activity 1.2). The final mitigation solutions are implemented in both countries under Activity 2.5 (supported by UT with close cooperation with the municipalities), following a shared logic to ensure comparability, replicability, and common learning outcomes. Throughout the pilot, the municipalities receive continuous technical guidance and field-level support from all partners involved.

Cooperation takes place through joint planning sessions, site visits, and cross-border meetings, many of which are scheduled alongside other project events to ensure broad participation. For example, Estonian partners will visit LEGMC's existing telemetry sites in Latvia to learn from their setup (Activity 1.1), and Latvian partners will visit Saaremaa's spring site and monitoring wells (Activity 1.5). These sessions result in shared technical plans, implementation schedules, and data integration strategies that support the early warning system.

In summary, both pilot actions (telemetry systems and digital spring monitoring with mitigation) are co-developed by all partners. Technical, scientific, and municipal partners from both countries contribute to every relevant activity. Rather than pursuing country-specific solutions, HydroScope takes a collaborative, cross-border approach to building an early warning system that is rooted in shared learning, joint technical development, and aligned goals. This ensures that the outcomes are innovative, scalable and sustainable across both national contexts.

4. Please explain and, if necessary, include corresponding information on planned system setup activities in Latvia under Activity 1.2, to complement the Estonian example in Saaremaa.

We assume that the question refers to Activity 2.1 – the piloting of telemetry systems – rather than Activity 1.2, which focuses on the preparatory analysis and definition of groundwater droughts and does not involve municipality-specific technical setups.

The planned system setup in Dienvidkurzeme follows the same general logic as in Saaremaa. GSE will procure and install approximately 7 to 10 telemetry systems in Saaremaa, with the exact number and type determined in collaboration with the municipality and other project partners based on which parameters are most relevant and where monitoring coverage is the most essential. Similarly, LEGMC is expected to procure approximately 5 to 7 telemetry systems.

The difference in budget and number of systems is due to the different starting points in each country. While Saaremaa requires the establishment of an entirely new telemetry network, in Dienvidkurzeme the focus is on strengthening and optimizing the existing network to support the early warning system. Depending on the results of the coverage analysis, the setup in Dienvidkurzeme may also prioritize fewer but more advanced systems that capture key site-specific parameters relevant to local groundwater management. This would also support the broader development of more advanced telemetry practices in Latvia. The final setup will be determined collaboratively, based on an assessment of existing infrastructure, results from the coverage analysis, and discussions with Dienvidkurzeme municipality and project partners.

In conclusion, the telemetry setup approach is consistent for both countries. The final selection of monitoring wells, parameters and sensor types will be based on technical assessments and close collaboration between project partners, ensuring that the monitoring networks are fit for purpose and fully integrated into the early warning system.

5. Please indicate the number of digital spring sites planned in Estonia and Latvia under Activity 2.2.

Under Activity 2.2, one digital spring site is planned in Estonia and one in Latvia, resulting in a total of two. Digital spring monitoring systems are more technically complex and resource-intensive compared to well telemetry, as they require equipment for continuous automated measurements of flow, water quality, and sometimes additional ecological parameters. This also makes them more costly. As this is the first time spring data will be used in an early warning system in either country, it is both practical and methodologically sound to focus on one site per country. This approach allows the project to properly test how the system functions, evaluate its usefulness for real-time monitoring and decision-making and understand its role in protecting groundwater-dependent ecosystems. Limiting the pilot actions to one spring site per country also ensures that sufficient attention can be given to understanding the specific environmental conditions around each spring.

6. Please explain how the guidelines developed under Activity 2.4 will be practically integrated into the platform's operation and use.

The guidelines developed under Activity 2.4 are directly integrated into the platform's operation and use in two key ways.

Firstly, the thresholds and indicators developed under Tasks 1 and 2, such as baseline conditions, pollution limits, and ecological thresholds, form the basis for how the early warning system functions. These thresholds are essential for the system to provide meaningful alerts. Without them, the early warning platforms could only show raw data, leaving municipalities to interpret on their own what constitutes a risk or an unacceptable condition. Instead, the guidelines define when groundwater quality or quantity becomes critical for either human use or ecosystem health, and they are embedded into the system logic to automatically trigger warnings or advisories when these conditions are met or approached.

Secondly, the mitigation and resilience measures developed under Task 3 are connected to the platform in a practical way. When municipalities receive an alert (for example, that nitrate levels are nearing a critical threshold or that drought conditions are emerging), the platform is complemented by the guidelines, which help municipalities understand what the risk means and what response actions are available. This means the platform informs about problems and directs users toward appropriate solutions, tailored to groundwater quality management and the protection of groundwater-dependent ecosystems.

During the project, selected measures from the guidelines will be piloted together with municipalities based on preliminary monitoring data, as described in Activity 2.5, and further under Question 1. This ensures that municipalities gain hands-on experience with the full decision-making process and are able to go from interpreting platform alerts to implementing actual mitigation and prevention actions. The developed guidelines that will be used for small-scale pilot actions during the project are thus crucial for building the capacity of municipalities to use the early warning platforms effectively after the project ends.

Guidelines developed under Activity 2.4 also align with Activity 3.1, specifically the preparation of user guides, which will further ensure that the guidelines are presented in an accessible, user-friendly format that complements the platform's day-to-day use.

7. For Activity 3.1, please define what types of technical documentation and user guidelines will be made public and which will be tailored specifically for participating municipalities. Also, please specify the content and materials planned to be developed for capacity-building seminars.

In Activity 3.1, the HydroScope project focuses on the publication and dissemination of the jointly developed early warning system to ensure its visibility, usability, and long-term impact. As part of this process, several types of technical documentation and user guidelines will be created, each tailored to different audiences and use cases.

Publicly available materials will include a general user guide to help both professionals and non-experts understand how to interpret and use the web-based early warning platforms published on the national GIS portals (Keskkonnaportaal in Estonia and LEGMC's portal in Latvia). This guide will explain the visual logic of the platform, such as the meaning of colour-coded alerts, how to toggle data layers, navigate the timeline, and access specific spring or well data. In addition, metadata will be published alongside the datasets, detailing when the data was last updated, which institution collected it, and under what methodology. A simplified technical overview of the machine learning algorithms used in the system will also be made available, focusing on transparency: it will describe what data types feed the model and what kinds of predictive alerts (e.g. drought or pollution risk) the system is capable of producing. These materials will be accessible directly from the platform interface and are modelled after similar guides used in existing national mapping portals.

Municipality-specific documentation will include a more detailed set of scenario-based user guidelines to the needs of Saaremaa and Dienvidkurzeme municipalities, but is designed to be adaptable by other regions in the future. These materials will include instructions on what steps to take when the platform signals a rising pollution risk or groundwater level decline. For example, if the concentration of a chemical compound increases in a digital spring, the guide will explain how to check for possible non-groundwater-related causes (e.g. surface contamination) and assess whether further sampling or field inspections are required. If a drought warning is triggered, the materials will identify which areas in the municipality are most vulnerable and recommend step-by-step response measures, such as water-saving protocols or communication with local water users. These guidelines will cover multiple categories of risk (e.g. groundwater quality, quantity, ecosystem thresholds) and outline actions that can be taken both immediately and preventively. While these materials will be provided directly to municipalities, a broader overview of this content (summarizing key findings, recommendations, and pilot outcomes) will be included in the project's final public report to support transparency and replication.

For capacity-building seminars, the project will produce a complete set of instructional materials to be used during and after the events. These include slides and scenario-based exercises. The content will explain the core functionalities of the early warning platform and provide a simplified explanation of how the machine learning models operate. It will also guide participants through practical examples of how to interpret system alerts and visualizations, and what actions could be taken in various real-world situations. These seminars will help a wider group of stakeholders (beyond the two pilot municipalities) understand how the platform can be used for operational decision-making. Case-based discussions will show how different user groups (e.g. municipal planners, environmental inspectors, emergency responders) can engage with the platform and how its outputs can support evidence-based responses.

8. For Activities 3.1 and 3.2, please provide a clearer structure distinguishing the various planned materials (e.g., stakeholder-friendly guides, reports, roadmaps) and explain how they complement one another.

Under Activity 3.1, the focus is on user guidance, awareness-raising, and capacity-building. The following key materials will be produced:

1) Municipality-specific user guidelines (targeted for Saaremaa and Dienvidkurzeme):
These materials are developed specifically for the two pilot municipalities (Saaremaa and Dienvidkurzeme) and are provided in Estonian and Latvian. They are practical, scenario-based guides explaining what steps local authorities should take when the early warning system issues alerts (e.g., rising pollution levels or declining groundwater levels). These guides will help municipalities interpret alerts, assess risks, and take appropriate mitigation measures. While they are based on content from the final report, they are presented in a highly practical and accessible form tailored to municipal workflows.

2) Capacity-building seminar materials:
These include slides used during stakeholder training events. They explain the functioning of the early warning platform, interpretation of alerts and visualizations, and possible actions that different stakeholders can take. The materials are prepared in Estonian and Latvian and will be made available to participants after the seminars. While thematically similar to the municipality-specific guides, these materials are more general and outreach-oriented, aiming to introduce the system to a broader stakeholder group, including sectoral agencies, NGOs, and potential future users.

3) Stakeholder-friendly outreach materials, including a one-sheet summary:
This concise, accessible document will summarize the core achievements of the project, including the location and purpose of the telemetry systems, the functioning and benefits of the early warning platform, and next steps. It is designed for decision-makers and will be produced in Estonian and Latvian. The Estonian version will focus more on the potential for future uptake of real-time monitoring solutions, while the Latvian version will highlight how existing telemetry data was used effectively for the first time in a real-time context. These materials are suitable for distribution at events, government-level meetings, or follow-up communication with relevant institutions.

Under Activity 3.2, the emphasis is on synthesising and documenting the full project process and outcomes to support knowledge transfer and replication. This includes:

1) Final report (in English):
A comprehensive report co-authored by all partners, documenting the methodology for real-time monitoring and predictive modeling, including lessons learned, system architecture, integration processes, and key findings. It will cover technical, ecological, and operational aspects, with dedicated sections explaining what worked well and what challenges were encountered. The report is intended for research and policy communities and future cross-border groundwater projects.

2) Replication roadmap:
This short, practice-oriented document will accompany the final report and be produced in English, Estonian, and Latvian. It is designed for municipalities, government agencies, and water authorities who may wish to implement similar systems. The roadmap will summarize key steps, suggest appropriate sensor types and coverage strategies, and provide guidance on scaling, from small pilots to national-level platforms. It will clarify which elements are context-specific and which are broadly transferable, and may include estimated cost ranges and planning considerations. It will be visually structured and user-friendly to support practical planning.

9. For Activity 3.3, please indicate the number, format, and expected audience of knowledge-sharing sessions. Please also justify participation in the EGU General Assembly, including the need for two representatives per country and its relevance for reaching the project objectives.

The planned knowledge-sharing sessions are larger internal project meetings, held online (in either Teams or Zoom). Their purpose is to review project progress, discuss any issues requiring joint input, and exchange practical knowledge among partners.

The exact number of sessions will be based on project progress and needs, but is estimated to be approximately once per quarter, or around 12 sessions over the project period. This number is somewhat flexible, and additional sessions may be organized when specific tasks are completed or technical challenges arise that require joint discussion. Each session involves all key project participants, though the number of attendees may vary depending on how partners assign project roles internally. On average, we expect participation from at least 6 participants from Estonia (representatives from GSE, EEA, UT, and Saaremaa) and 5 participants from Latvia (LEGMC, UL, and Dienvidkurzeme). Smaller working group meetings will be held when necessary to resolve more specific issues, while broader knowledge-sharing sessions focus on key project milestones and collaborative learning.

Participation in the EGU General Assembly is also an essential part of Activity 3.3. EGU is the largest geoscience conference in Europe, bringing together leading experts in groundwater monitoring, machine learning for drought and flood prediction, and automated environmental monitoring systems, all of which are directly relevant to the HydroScope project. As this is the first time the project team (or anyone in the Baltics) is applying telemetry data in the context of a groundwater early warning system, attending EGU provides valuable opportunities to learn from global best practices and explore how similar platforms have been developed in other regions. EGU also hosts a large exhibition of equipment providers, including companies specializing in groundwater telemetry systems. This is particularly important for HydroScope, as it allows the team to compare technical solutions, understand the strengths and limitations of various systems, and make informed decisions about both current and future monitoring setups.

Sending two participants per country is a practical necessity given the multidisciplinary nature of the HydroScope project. For example, one representative may focus on groundwater contamination and mitigation, while another focuses on data modeling, machine learning or technical infrastructure. The EGU General Assembly is one of the few events that covers all these disciplines in one place. Dividing attendance between participants with different areas of expertise ensures that the project team can efficiently cover all critical topics, connect with relevant experts and bring back applicable knowledge to support both scientific and practical components of the project.

10. Please explain why only five organisations are expected to continue cross-border cooperation post-project, despite seven being represented in the project partnership.

Our aim is to maintain cross-border cooperation among all seven project partners after the project ends, and we will be actively working toward that goal. The reason five organizations (GSE, LEGMC, EEA, UL, UT) are listed with a higher degree of certainty is simply because these are scientific and governmental institutions that already have a long-standing history of collaboration through previous projects and other initiatives, like cross-border river basin management plan meetings. Among these five organizations, the intent to continue collaboration beyond the current project has already been discussed during previous projects, and there is a very strong foundation for continued joint activities.

With partner municipalities, the situation is somewhat different, not because of a lack of interest, but because their participation in future cross-border collaboration typically depends on the thematic focus of upcoming projects, their local priorities and available resources at the time. That said, we are committed to strengthening collaboration with both Saaremaa and Dienvidkurzeme municipalities during the HydroScope project. Discussions about potential follow-up initiatives will include all partners, as our goal is to ensure that collaboration continues not only between the core scientific partners but also with the municipal partners whenever the scope and needs align.

So, while the five aforementioned institutions have an already established pattern of cross-border cooperation that will certainly continue, we are still fully committed to working toward extending future collaboration to all seven partners wherever possible.

11. The budget related conditions:

In the budget of LP1, please justify the number of working hours planned for the financial manager. If justification is insufficient, the costs must be reduced.

As the lead partner of the HydroScope project, GSE will carry full responsibility for financial coordination across all 7 partners of the project. This includes preparing and submitting financial reports, ensuring compliance with eligibility rules, managing partner contributions, and communicating with the Est-Lat programme. The financial manager must also coordinate and process internal budget changes, support partners in solving financial reporting issues, and ensure the project is fully prepared for audits.

Additionally, GSE is responsible for overseeing salary payments, maintaining documentation, and ensuring all financial procedures align with the programme requirements. These tasks require continuous attention throughout the project's duration. Considering the workload, a planned allocation of approximately 0.3 FTE for the financial manager is both reasonable and necessary to ensure accurate and timely financial management.

In the budget of LP1, please provide a cost breakdown and justify the costs allocated for communication and awareness materials. If justification is insufficient, the costs must be reduced.

The allocated **1 100 € (reduced cost)** covers essential communication and awareness materials for events and stakeholder engagement activities led by the Lead Partner (GSE), primarily under WP3 (Dissemination, capacity building and outreach). These materials are modest in scope but necessary to ensure high-quality, professional communication that aligns with programme visibility rules and supports stakeholder engagement.

The majority of project communication is digital to minimize environmental impact and cost. However, some printed and well-designed visual materials are essential to ensure the effective uptake of the project's outputs, especially when communicating complex technical topics like telemetry, predictive modeling, and groundwater protection to local decision-makers and non-technical municipal staff.

This amount represents a modest and cost-efficient communication budget, sufficient to cover the minimum necessary materials to meet project visibility and stakeholder engagement goals. This includes printed agendas, name tags, and workshop handouts. Additionally, this includes external graphic design service to create clear and visually engaging instructional materials for stakeholders attending the national capacity-building seminar. These materials will help municipalities understand how to use the early warning platform in their workflows.

Please justify the need for participation in the EGU 2026 conference. Clarify what is included under the membership fee and abstract submission, and how these expenses directly contribute to the project's objectives. If justification is insufficient, the costs must be reduced.

Participation in the EGU General Assembly is an essential part of Activity 3.3 (internal capacity building), as it directly supports the HydroScope project's objectives related to innovation, cross-border learning, and long-term sustainability. EGU is the largest geoscience conference in Europe, bringing together global experts in key fields relevant to HydroScope, including groundwater monitoring, machine learning for drought and pollution forecasting, and automated environmental data systems. As HydroScope is the first initiative in the Baltics to pilot a real-time telemetry-based groundwater early warning system, it is crucial for the project team to learn from international best practices, explore how similar platforms have been developed elsewhere, and apply these insights to improve project outcomes. EGU also features a large technical exhibition with leading telemetry equipment providers. Attending this exhibition enables project staff to assess the latest monitoring technologies, compare solutions, and make informed decisions for the current and future development of national monitoring systems in both Estonia and Latvia.

Due to the multidisciplinary nature of HydroScope, sending two participants per country is necessary. For example, one participant may focus on hydrogeology and groundwater quality, while another specializes in machine learning, data pipelines, or system integration. EGU is one of the few events that brings together these diverse topics under one roof, ensuring that the full range of HydroScope's technical and scientific components is addressed.

All participants will also submit abstracts presenting HydroScope results, which directly supports the project's outreach and visibility goals. At EGU, presenting a poster or talk significantly increases the chances of attracting relevant contacts, such as researchers working on similar tools, environmental agencies, and technology providers. Being featured on the programme also makes it easier for participants to find and connect with HydroScope representatives.

Participation in EGU requires two mandatory but small additional costs beyond the conference registration fee:

1) An EGU membership fee (approximately €10–20 per person), which is required to register for the event;
2) An abstract submission fee (approximately €50 per abstract), which covers processing and ensures that the contribution is included in the official programme.

In the budgets of LP1 and PP2, please justify the quantity and cost of the digital spring monitoring equipment, ensuring it is necessary and proportionate to the pilot activities.

Both partners (GSE in Estonia and LEGMC in Latvia) plan to procure and install one digital spring monitoring system, with a budget allocation of 21 500 € per unit. This amount is based on existing experience in Latvia, which indicates that the typical cost of a complete digital spring system falls within the 20 000–21 000 € range. These systems are technically complex, as they continuously measure both discharge (flow) and physico-chemical parameters. Unlike groundwater wells, springs offer a unique opportunity to assess groundwater discharge under natural, undisturbed conditions, making them ideal for evaluating ecosystem health, baseflow dynamics, and climate-related impacts.

These systems are essential for piloting real-time monitoring at spring sites, and this activity cannot be meaningfully conducted without such equipment. The budgeted cost is appropriate and proportionate considering the technical requirements and the market price of these systems. The total cost also includes a small buffer of 500–1 000 € per country to cover installation materials, such as protective mounting frames or small adaptations that may be needed at the selected spring sites. Final equipment specifications and exact costs will be confirmed during procurement, but both countries will jointly ensure that the selected systems remain within the allocated budget.

Provide justification for the number of hours allocated to web-based application development and clarify whether this refers to the same platform described in other sections of the application form. If justification is insufficient, the costs must be reduced.

The budgeted cost of 25 000 € per partner (EEA and LEGMC) is intended for the development and integration of two separate web-based platforms, each developed for one country. These platforms are not separate systems but two interfaces connected to a single, jointly developed early warning system that includes real-time telemetry, machine learning–based predictions, and ecological insights. The reason two platforms are needed is practical and strategic: the HydroScope system will be embedded into existing national GIS portals (Estonian Keskkonnaportaal and the LEGMC GIS portal), which are already known and trusted by municipalities and environmental agencies. This ensures long-term accessibility, usability, and sustainability of the platform after the project ends, without requiring a new standalone web solution, which would be significantly more expensive to develop and maintain.

The budget of each 25 000 € allocation includes:

1) the integration of real-time data pipelines from telemetry and digital spring systems,

2) automation of map updates and visualization of predictive results (e.g. droughts, pollution risks),

3) user interface development to national systems, workflows, and language,

4) iterative testing and refinement based on project partner feedback.

While we cannot specify the number of working hours in advance since development may be contracted as either fixed-price or hourly service, depending on the provider, the budget reflects our partners' expert estimates of the minimum feasible cost to deliver these platforms. Cutting these costs would directly compromise the functionality, usability, and long-term value of the early warning system. Therefore, the allocated sum is entirely necessary to meet the technical and strategic goals of the project.

Please justify the planned catering costs for LP1, PP3, PP4, and PP7, ensuring they are appropriate and clearly linked to project events or activities. If justification is insufficient, the costs must be reduced.

1) LP1 (7 000 €): Covers two separate 2-day events in Tartu. The first event will host approx. 15 participants (budget 2 500 €), and the second event will serve 30–35 participants (budget 4 500 €). Both include coffee breaks and lunches. These estimates are based on recent experience with similar seminars in Tartu and reflect typical costs for professional catering, including VAT and service fees.
2) PP3 (3 500 €): Covers a 2-day event in Riga. Day 1 is a stakeholder seminar for ~25 participants, and Day 2 is an internal workshop for ~10 participants. Riga's catering services are typically more expensive due to higher base prices in the capital. The budget reflects local market rates and includes coffee breaks and lunches.
3) PP4 (3 500€): Covers two days of activities in Saaremaa, including a workshop day (~25–30 participants) and a field trip to pilot sites (telemetry wells and digital springs). Catering includes coffee breaks and lunch for both days. The budget also accounts for logistical costs in a rural location, where fewer catering providers are available and transport costs may apply.
4) PP7 (3 500€): Covers a similar 2-day format in Dienvidkurzeme: approx. 1,5 days of discussions and half-day field visits to potential pilot sites, with ~25 participants. Catering covers lunches and coffee for participants and external guests involved in site selection and platform development.

In summary, taking into account the increased catering prices in recent years, the number of participants, the full-day nature of these events, and the partners' recent experience in organizing similar gatherings, we consider the planned catering budgets to be appropriate, proportionate, and well-justified. They are sufficient to cover essential hospitality needs without being excessive.

Please justify the costs for the high-performance computer for PP3 by specifying its use in relation to "the study areas" and its necessity for project implementation. If justification is insufficient, the costs must be reduced.

A high-performance computer is essential for UL's role in developing advanced machine learning models, which require significantly more computational power than standard office computers. These models, developed under task WP1 Activity 1.3, will integrate diverse datasets, including real-time drought and pollution prediction based on data from both Estonian and Latvian study areas, to predict groundwater levels and assess drought and pollution risks in both countries.

While the high-performance computer itself will be physically located at the University of Latvia in Riga, it will process data from both pilot areas: Saaremaa (Estonia) and Dienvidkurzeme (Latvia). The location of the hardware does not affect the relevance of the data, as its function is to deliver cross-border predictive tools that support municipalities in both countries. UL is the only partner in the project with the necessary expertise in machine learning, which is why this work must be carried out at their facilities in Riga.

The current computing resources available to the UL team are inadequate for such advanced modeling due to limitations in processing power and RAM capacity. A new high-performance computer is therefore necessary to ensure the successful execution of these tasks.

While the primary use of this computer will be for WP1 Activity 1.3, it will also support WP1 Activity 1.2 for historical data analysis and other UL activities within the project.

Equipment and related staff costs listed by PP4 and PP7 need to be justified, ensuring they are directly linked to pilot activities and necessary for achieving the intended outcomes. If justification is insufficient, the costs must be reduced.

The equipment and related staff costs under PP4 and PP7 are directly linked to Activity 2.5 and are essential for the successful implementation of the jointly developed early warning system. These costs support the maintenance, cleaning, and small-scale mitigation measures at digital spring pilot sites, ensuring that monitoring data remains reliable and actionable.

Spring monitoring is only effective when the spring site reflects true natural groundwater conditions. However, many springs are impacted by surface-level disturbances such as litter, erosion, unmanaged access, or runoff from surrounding land. Without proper site maintenance and protection, telemetry data from digital springs can show pollution from surface inputs instead of groundwater sources. This would undermine the reliability of the early warning platform, leading to incorrect risk assessments.

To prevent this, equipment is needed to clean and protect the digital spring site, install visitor management infrastructure, and prevent surface contamination. The exact equipment depends on the final site conditions, which will be determined collaboratively during the project. These are not large infrastructure investments, but rather essential field tools and materials needed to ensure the usability of the digital monitoring system.

The digital spring site maintenance technician positions in both municipalities are necessary to support these efforts. These roles are temporary, project-funded staff who will:

1) perform site cleanup and maintenance, install and monitor small-scale mitigation measures,
2) ensure the monitoring equipment remains protected and functional,
3) respond to any platform alerts (e.g., pollution spikes or abnormal discharge) by checking conditions on site,
4) collaborate with UT and UL to implement ecological or technical recommendations from Activity 2.4.

These tasks require regular attention throughout the project to ensure pilot sites remain viable for continuous, high-quality data collection. Moreover, the hands-on experience gained by municipal staff in maintaining spring sites and implementing real-time mitigation actions is a critical part of building long-term capacity. The HydroScope platform is designed to support informed and timely municipal action. For that to be effective, the municipalities must also be equipped to act, and this includes the necessary personnel and basic tools.

Please clarify whether bus rental costs are intended for project staff or external participants, and how they support specific project activities. Please note that travel and accommodation costs for project staff fall under the cost category "Travel and accommodation".

The bus rental cost (approx. 800 € each) covers two separate one-day field trips (one in Saaremaa and one in Dienvidkurzeme), which take place as part of the respective 2-day pilot area events organized by the municipalities. These field trips are a key part of the events, designed to bring participants on-site to visit digital spring monitoring locations and groundwater telemetry wells established through the project.

The bus will be used exclusively during the event day to transport participants from the event venue to multiple monitoring locations and back. The trip begins and ends at the same location where the event is held. It is not a transfer to the event location, but rather an integral part of the event itself, allowing participants, including project partners and relevant stakeholders, to gain a shared understanding of the selected spring sites, the progress in installing digital monitoring systems, and local hydrogeological conditions.

This bus rental:

1) is not for project staff travel to/from the event and therefore does not fall under the "Travel and accommodation" cost category,
2) is a logistics cost related to event implementation, comparable to venue or equipment rental.
3) cannot be replaced with individual ticket purchases, as the destination is rural, the field trip is coordinated in a single group, and transportation to multiple remote locations is needed.

The cost (approx. 800 €) covers a 30+ seat bus, including fuel and driver, and is based on market prices for such services in rural regions.

We trust that the explanations provided here adequately address all the stipulated conditions. We are prepared to update the project application in the Jems system as soon as this content has been agreed upon with the Joint Secretariat.

Please do not hesitate to contact us should you require any additional clarification or documentation.

Sincerely

(signed digitally)
Magdaleena Männik
Hydrogeologist
Geological Survey of Estonia

(signed digitally)
Sirli Sipp Kulli
Director
Geological Survey of Estonia