Public Description of the Project

If my tender is successful, I authorize to publish the following summary for marketing purposes. Accordingly, this summary is mandatory, but will not be assessed as part of the tender. By submitting this tender, I hereby grant full permission for the publication aforementioned.

Bidder Details	**Type/ size of legal entity**	**Place of performance of contract activities**	**Logo**
Lead contractor of "Temporary Association of Company" **Ladurner S.r.l.** Via Innsbruck 33, 39100 Bolzano, Italy Lorenz San Nicolò +39 3351738706 Lorenz.SanNicolo@ladurner.it Vito Schifano +39 3351738706 Vito.Schifano@ladurner.it Davide Furlan +39 334 6008852 areagare@laduner.it	Private company (S.r.l.). 150 employees	% of contract value allocated to main contractor: **75 %** % of activities for the contract performed by the main contractor in EU Member States or countries associated with Horizon 2020: **95 %**	
Member of "Temporary Association of Company" **PeroxyChem Spain S.LU** Calle Afueras s/20, 50784, La Zaida – Zaragoza, Spain +34 9 34167400 Alberto Leombruni +39 389 5121600 alberto.leombruni@PeroxChemcom Michael Mueller +43 664 1803060	Private company (S.r.l.). 165 employees EMEA, 550 worldwide	% of contract value allocated to contractor [x]: [complete] % **25 %** % of activities for the contract performed by PeroxyChem in EU Member States or countries associated with Horizon 2020: [complete] % **95 %**	

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Project abstract ***(4000 characters maximum)***

[Add an abstract of the winning tender, giving a brief project description agreed with the contractor that is suitable for publication purposes]

The research "Temporary Association of Company" ("ATI") formed by Ladurner S.r.l. (Ladurner) and PeroxyChem Spain S.LU (PeroxyChem) proposes an innovative remedial approach for the candidate POSIDON sites based on degradation of hydrocarbon pollutants with the **in-situ chemical oxidation method (ISCO)** integrated with **binder solidification and stabilization (SS)** for the immobilization of metal pollutants **(M)** and geotechnical stabilization of soils to allow a rapid site restoration and reuse. The proposed approach designation will be **ISCOSSM**.

The technology consists in the use of a composite reagent based on chemical oxidants, hydraulic binder regents and performance improvement additives and its delivery and uniform distribution in the soil contamination source area using soil mixing technology. The composite formulation may be differentiated across a site to address the non-uniform distribution of contaminants and heterogeneous soils composition.

Among the commercially available chemical oxidants used in remediation, persulfate is the preferred for the proposed application as it is applicable to the POSIDON hydrocarbon contaminants of concern (PAHs and TPH), has a lower level of interaction with the subsoil environment (Natural Oxidant Interaction - NOI) (Sra, 2010) and is stable for several weeks after administration and (Yin et al., 2011).

Hydraulic binders such as lime or cement promote the alkaline activation of the persulfate, that is the formation of powerful radicals that are responsible for the oxidation of organic pollutants, and of a number of reactions, referred to as pozzolanic reactions, which result in changes in soil physical, physico-chemical, mineralogical and engineering properties of soils. The effect of pozzolanic reactions is the immobilization of metal contaminants and any residuals hydrocarbons which have not been degraded by the oxidant by either chemical mechanisms (stabilization) or physical mechanisms (solidification). In addition, binder treatment can be designed to simultaneously improve the geotechnical properties of the treated solid matrix both in the short-term (during construction) and in the long-term (post-construction). For example, the application of binders can be designed to increase the shear strength / bearing capacity of the soils during construction, to support construction equipment, and after construction to allow site rehabilitation and reuse. The use of binders can also be designed to reduce the hydraulic conductivity of the source area of orders of magnitude with respect to the pre-treatment conditions. As a result, groundwater flow is typically diverted from the treated zone. Thus, the ISCOSSM approach becomes effectively

an integrated remedial source treatment / hydraulic containment /ground improvement solution.

In-situ soil mixing technology is proposed to deliver and blend the composite reagent in the soil target contaminated source areas. The reagent is injected under pressure at the tip of a mixing unit, which rotates at high speed (and energy) thus ensuring the de-structuration of soil aggregates and the uniform distribution of the reagent. This technology allows uniform delivery of the reagent in a wide variety of soil types, media with heterogeneous composition including mixtures of soils and waste materials, saturated or unsaturated soil conditions (i.e. depth of aquifer), and depths of contamination. The technology allows treating several hundred cubic meters per day, per mixing unit.

Once the composite reagent is uniformly blended in the contaminant source area, the chemical reactions start. The chemical oxidation and pozzolanic reactions start instantaneously. Chemical oxidation lasts until there is free water available in the mix zone. As the reagent is stable for week or months in the soil, the chemical oxidation reactions may be reactivated by re-wetting the treated area. Pozzolanic reactions may last longer, often months, but most of their beneficial effects are typically reached within days from mixing.

Due to the high production, rate of reactions and simultaneous improvement of soil geotechnical properties, the ISCOSSM approach is very fast, cost-effective and allows rapid closure and restoration of contaminated sites.

All of the above considerations, together with the fact that the technology does not require handling of contaminated materials, treatment or disposal of groundwater and does not generate secondary waste, allow to conclude that the ISCOSSM technology is ideal for applications at large complex sites where the integration of remedial, short-term constructability and long-term post-treatment restoration objectives is required.