LAGUNA - WP3

Safety, Environmental and Socio-economic

Aim: identify general and specific hazards for the sites; establish associated safety protocols and additional infrastructure to mitigate the risks.

Background

Recognizes importance of Health and Safety to all - implications of a serious incident in a LAGUNA site are profound and depending on the severity could result in the closure of all facilities. Important to coordinate on this issue

Recognizes general point that mine sites have different issues compared to tunnel sites - e.g. with regard to emergency egress, ventilation, fires, liquid gas emergencies, air quality monitoring. Appraisal of each site will reflect this.

Recognizes site specific and generic issues - e.g. tanks and liquids

safety, legal, local support

LAGUNA - WP3

Safety, Environmental and Socio-economic

Deliverables 3.1 - 3.4

3.1	Site specific safety overview report	3	USFD	20	Report	CO
3.2	Final report on safety	3	USFD	20	Report	CO
3.3	Report on liquid procurement	3	USFD	10	Report	RE
3.4	Report on socio-economic impact	3	USFD	10	Report	RE

Tasks and responsibilities as specified

Task 9 Assessment of hazards events and risk analysis (USFD coordinator) **WP3.1**

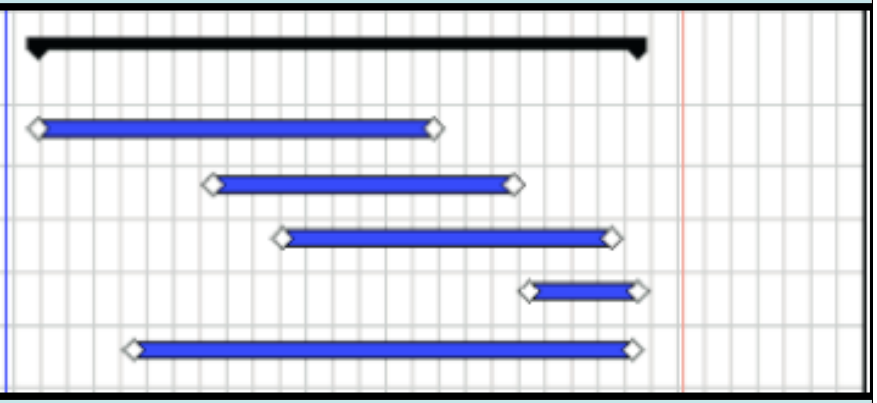
Task 10 Safety & monitoring of large underground tanks (ETHZ, Technodyne) **WP3.3**

Task 11 Site specific impact of liquid procurement and tank filling (ETHZ, Technodyne, USFD)

Task 12 Final report on safety and environmental issues (USFD coordinator) **WP3.2**

Task 13 Socio-economic impact of the research infrastructure on the sites (USFD coordinator) **WP3.4**

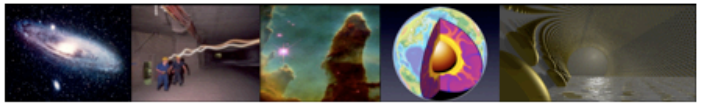
WP3 – Safety, environmental and socio-economic issues	5/28/08	4/14/10	491.00
Assessment of hazards events and risk analysis	5/28/08	8/26/09	326.00
Safety and monitoring of large-scale tanks	12/15/08	11/24/09	247.00
Site impact of liquid procurement and tank filling	3/5/09	3/17/10	270.00
Final study on safety and environmental issues	12/14/09	4/14/10	88.00
Socio-economic impact of the research infrastructure on the sites	9/15/08	4/9/10	410.00



Deliverables 3.1 done

273 page report complete - first major LAGUNA document

LAGUNA Design Study
Health, Safety, Environment and Socio-Economic Overview Report
(Deliverable 3.1) - in strict confidence



Introduction

This document constitutes a report on the Health and Safety issues for each of the seven LAGUNA sites as required for deliverable 3.1 of workpackage WP3 of the LAGUNA design study. Information is provided in the form of a series of separate reports and annexes from each site, assembled here into one document. The work should be regarded as a draft of the input on H&S expected by each site for the final report for LAGUNA due at the end of the project. As such each site has provided details as known so far, recognising that work is still in progress and that more details or updates will be provided for the final LAGUNA reports. There are thus some gaps and omissions. Subsequent WP3 deliverables are required on the socio-economic aspects of LAGUNA at each site. However, significant progress has already been made on this by several sites. Hence, whilst not strictly necessary here, we have included information on these areas where appropriate. To assist with digestion of the data the majority of information is provided in the form of a set of standard tables, jointly developed, backed by supporting text and annexes from each site. The Health and Safety tables are configured in a risk analysis format with separate assessments given for the three detector options as appropriate to each site, designated G (GLACIER), L (LENA) and M (MEMPHYS).

Contents

The seven reports for deliverable 3.1 are provided in alphabetical order as follows, each section containing report, tables and annexes relevant to that site:

Boulby (UK)
Canfranc (Spain)
Frejus (France)
Italian site (Italy)
Phyasalmi (Finland)
Sieroszowice (Poland)
Slanic (Romania)

Table of Contents

Deliverable
WP 3.3

Task 10 - Liquids (ETHZ, Technodyne)

Task 10 Safety and monitoring of large underground tanks

- **Tank/delivery instrumentation, gauges, leak detection**
- **Delivery-tank interconnections, communications**
- **Impact on cavern construction....**

Some overlap between general safety/environment deliverable and liquid procurement deliverable...

Task 11 - Liquids (ETHZ, Technodyne, USFD)

Task 11 Site specific impact of liquid procurement and tank filling

This task will evaluate the *methods of procurement* in large quantities of each target liquid and the consequence for each specific site.

- **Identify potential safety and environmental risks for each target liquid**
- **Assess legal authorization requirements for each target liquid**
- **Strategies to bring very large quantities of liquids into the underground tanks**
- **Availability nearby the sites will be investigated and costs for transport will be estimated taking into account purity at delivery**
- **Methods of local production and their impact on the site will be assessed.**
- **The filling techniques of deep underground tanks avoiding recontamination will be defined.**
- **methods to further purify and maintain high purity levels**
- **emptying of the tanks will be addressed.**

Liquid Procurement example

G7.2 Industrial Partnership for Liquid Procurement at Boulby

To achieve the proposed Boulby specific liquid argon delivery assessment discussion has started between the following companies:

(1) Air Products Ltd. – UK based company expert in production and delivery of cryogenic liquids in the UK and Europe (also USA and Asia).
(2) Technodyne Ltd. – Design engineers expert in large LPG tank design
(3) CPL – the mine company at Boulby, expert in the logistics of transportation of equipment underground..

(1) potential cost savings from proximity of local supplies of liquid argon from nearby Tees industry and Air Products plants at Hull: The location of Boulby close to existing Air Products and Linde/BOC liquid argon production at Tees, Hull and Carington, plus access to a dedicated port, rail and A-class roads, provide an estimated saving of 30-50% in argon costs over other locations in Europe (AP private communication).

The vast pertro-chemical industry in nearby Tees has several companies that can produce liquid argon and scintillator materials. The mine owns a rail line in that direction. Fig. G7.3.1 shows the proximity of the BOC plant to Boulby, about 30 km.

e.g. Boulby:

Significant work included in WP2, deliverable WP2.8

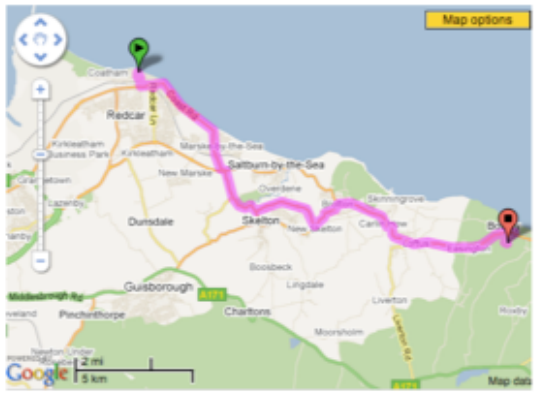


Fig. G7.3.2 Proximity of the Air Products plants to Boulby, Hull is ~150km.

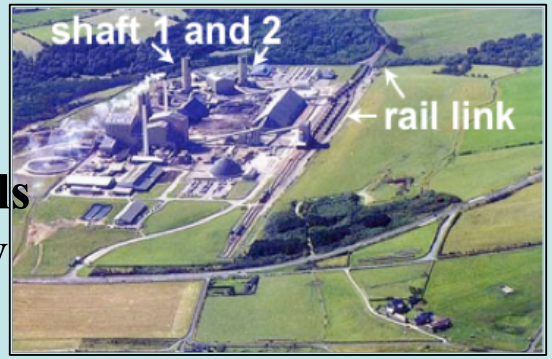
Supply Routes and Storage Example

http://www.itp-interpipe.com/

- Looking at possibility of cryogenic pipeline direct from Tees Petro-Chemicals 30 km and down shaft
- Liquid pipe down shaft

- Cryogenic pipelines of 50+ km exist!

- Rail, Road, Ship options also possible
- Storage space for materials available on site already



WP3.3 Template per site

(1) Identify methods of procurement of large quantities (per site, per liquid)

Liquid Argon: Andre,
Scintillator: Franz, Michael
Water: site specific...Memphys

- what (local) suppliers?, time scale for production, costs
- what transport to site (rail, road...)

(2) Environmental impact, safety, logistical, issues of transport to site

(3) On site storage and/or transfer underground

- construction of underground pipeline, intermediate storage, safety
- transfer by containers through shaft/tunnel

(4) Possibility of production on site and/or underground

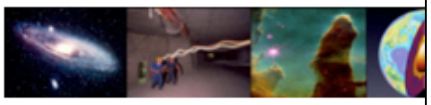
- e.g. water purification, liquid argon production
- power consumption, ventilation, safety and disruption to tunnel/mining

(5) Maintenance of liquid purity during and after fill

- LAr boil-off sell it, disposal...agreements with company

WP3.3

currently 93 pages



LAGUNA Design

Liquid Procure
(Deliverable 3

in strict confid

The LAGUNA consortiu

FP7 Research Infrastructure "Desig
LAGUNA (Grant Agreement No.

LAGUN
Liquid Procur
(Deliverable 3.3

EXECUTIVE SUMMARY

This document provides an overview of curr
LAGUNA in line with deliverable WP3.3 of t
at this stage fully costed scenarios or enginee
make an assessment of possible critical path
aspects to liquid procurement that apply e
available from companies, but also that there
technology needed for sites with horizontal
access.

Contents

An overview plus seven reports for deliverable
each section containing report, tables and ann

Boulby (UK)
Canfranc (Spain)
Frejus (France)
Phyasalmi (Finland)
Sieroszowice (Poland)
Slanic (Romania)
Umbria, Italian site (Italy)

LAGU
Liquid Proc
(Deliverable 3

1.0 Introduction

Liquid procurement, be it liquid scintillator
factor to consider for LAGUNA at any site,
brings together the current situation, draw
document is divided into two main parts. T
relevant independent of the site. The secon
individually. This takes the form tables
following site specific aspects:

- methods of procurement of large q
- transport to the site - environment
- on site storage and/or transfer un
- possibility of production on site an
- tank filling and maintenance of liqu

In addition each site was asked to prepa
focussing on the feasibility of obtaining, tra
is provided in additional to the appropriate
consideration are liquid scintillator (50
megatonne). The work remains in progre
available. The emphasis in this report is on

2.0 Liquid Argon Procurement

2.1 Background information on liquid

Argon is produced industrially by the fracti
argon. This process separates liquid nitrog
point) and oxygen (90.2 K boiling point).
tonnes per year [1]. Argon, nitrogen and
refining and processing. There is a significa

To fill a 100 ktonne tank in 2 years would r
This could be delivered via pipes from an a
consignments are used, this would need aro
cryogenic containers are available of simila
link, provided sufficient containers were ma

A large scale air separation plant is operate
to the cost of $13 million and produces 500
(78% nitrogen), this process would yield 5.
100 ktons would take approximately 45 yea

SLANIC

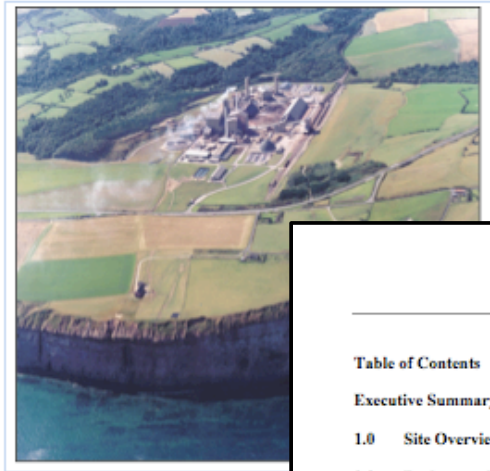
LAGUNA Design Study
Liquid Procurement for LAGUNA at Slanic
(Deliverable 3.3) - in strict confidence

Horia Hulubei National Institute of RD for Physics and Nuclear Engineering - IFIN-HH

WP3.3 Draft Status

Example for Boulby

LAGUNA Design Study
Liquid Procurement for LAGUNA at Boulby
(Deliverable 3.3) - in strict confidence



FP7 Design Study:
CPL and University of Sheffield

Table of Contents

Executive Summary

This document presents a draft overview of th
LAGUNA at Boulby, in particular the feasibilit
for use on site. Important factors concerning th
liquids under consideration are liquid scintillator
(1 megatonne). The document here is a draft su
Annex table supplied. The work remains in pr
becomes available. The emphasis in this report

1.0 Site Overview

Boulby is as salt, potash and (soon to be) miner
on the coast 20 km north of the town of Whitby
Ltd., a subsidiary of ICL and has been in conti
are ~900 employees with a further 3000 employ
mine currently extends for over 10 km in most
including areas well under the North Sea. It is c
to access new hard rock minerals at various leve
of new tunnels per year amounting to a capacity

The company has as strong track record
available caverns for this in 1989 in connection
1999 the University of Sheffield with Rutherfor
funds to build a new underground laboratory an
1100 m depth and with 1000 m^2 of air conditi
other experiments, notably, ZEPLIN I, II, III,
background devices. This is the only significan
in a deep mine site.

2.0 Background to Liquid Procurement fo

Boulby is close to large industrial zones, namel
km away. Tees Valley contains a number of l
Dupont, Dow, Lucite International, Huntsman
BOC Gases (part of the Linde Group) also has a
link connects Boulby to the Tees Valley area,
mine company CPL. There are further major p
good road and rail links to the area. The Boul
power station.

Boulby is located within the North Yorkshir
conserved areas. The establishment of an large
likely environmental issues are well understoo
well known. Construction of new surface liqu
well established principles, for instance that the
has height not exceeding current main buildings
delivery off-site to avoid potential planning
identified for instance at Skinningrove, around

3.2 Liquid argon and Boulby

In the case of Boulby, salt and potash is being extracted from the Zechstein bed which runs from the UK under the North Sea to Germany, Denmark and Poland. Gases extracted from the mine should be enriched in argon, however, because atmospheric air is used for ventilation, the outflow air will be contaminated. If any pipeline existed within the mine for the removal of gas pockets encountered underground, its content could provide a valuable source of argon (actually radiopure argon). This possibility of direct extraction from underground gas at Boulby needs further study.

The following is a list of facilities that have been identified as possibly capable of producing argon relatively close to Boulby.

- Conoco-Phillips operates a gas terminal at Theddlethorpe, Lincolnshire, which provides gas and condensate processing facilities. It is connected to the Transco and Kinetica pipeline systems.
- Total operates a gas terminal at St. Fergus, Aberdeenshire. It receives and processes gas and condensates from over twenty North Sea fields. Norwegian gas is imported through this terminal. There is also a Shell/Esso gas terminal at an adjacent site.
- Shell operates a gas terminal at Bacton, Norfolk. It is one of the largest gas terminal complexes in the UK and has a link to Zeebrugge where Statoil produced gas from Norwegian fields are processed.
- Centrica operates a gas terminal at Easington, East Yorkshire. Its main functions are to receive and separate natural gas from the Rough offshore field and the BP operated Amethyst field. The Rough field is also used as a storage facility. BP have a terminal at the adjacent Dimlington site.
- In the Netherlands Emden has been a centre for receiving Norwegian gas deliveries since the Norpipe system became operational in 1977. The Norsea Gas Terminal (Conoco-Phillips) and Europipe Metering Station (Statoil) stand side-by-side near Emboden. These facilities receive gas from Norwegian fields through Norpipe and Europipe.

There are likely several other production facilities but further investigation is needed. Some of these also could allow the possibility of argon with recued ^{39}Ar. The North Sea gas and oil fields are below the Zechstein salt and potash but must be in gaseous contact with it. No figures for argon concentrations in these fields have yet been identified. Isotopic ratios of argon in North Sea oil have been published by Ballentine [7], who is a leading expert. North Sea gas is exploited by a number of companies and brought ashore at various points in the UK.

4.0 Liquid Scintillator (LENA)

4.1 Background information on liquid scintillator

Small quantities of liquid scintillators are typically purchased by the biomedical research community. These can be packaged in one to five litre containers, with a typical consumer purchasing several hundred litres per year. There would hence be a large adjustment required for any company to be able to supply the required 50 ktonnes on a one-off basis. A dedicated liquid scintillator pilot plant operated by the collaboration may be a more desirable option. This is the route that has been adopted by some previous collaborations.

WP3.3 Draft Status

Example for Boulby

ANNEX 2: Draft Liquid Procurement Tables

(1) Identify methods of procurement of large quantities (per site, per liquid)

Source of liquid, company and status of contacts	
Location of supplier, distance to site	
Transportation options and procedures	

(2) Transport to the site - environmental impact, safety, logistical issues

	Water	Scintillator	Liquid Argon
Transport optio bring liquid to s status of assessr			
Relevant author concerned with transportation t site, permission of contact			

(3) On site storage and/or transfer unde

	Water
What requirement is there for surface storage?	None required the unlikely eve underground purification and is not feasible.
Status of surface storage design and permissions	None assumed
Environmental and safety risks and issues for surface storage	None assumed
Method and procedures for transportation underground	Use of undergr pipeline preferr

(4) Possibility of production on site and/or unde

	Water
Summary description of underground or surface liquid production plant proposal if applicable	Production is preferred underground using a dedicated purification plant. This can make use of well-known techniques.
Requirements for power consumption and ventilation for on-site production	No major requirement
Safety and environmental risks of on-site production	No major risks
Requirements for new infrastructure and services	Pipelines, tanks and pumps – within normal expertise
Disruption to normal operations of tunnel or mine	Disruption is expected for installation of the pipeline but can be minimised by selection of the underground tunnel route

(5) Tank filling and maintenance of liquid purity during and after fill

	Water	Scintillator	Liquid Argon
Summary of tank filling strategy and sequence underground avoiding recontamination	This requires input from Technodyne Ltd. Experience from SuperK can be used to mitigate against risk of contamination	This requires input from Technodyne Ltd. And LENA on purification options. Experience from Borexino and others can be used to mitigate against risk of contamination	This requires input from Technodyne Ltd. And GLACIER on purification options. Experience from ICARUS and ArDM and others can be used to mitigate against risk of contamination
Safety and environmental risks of filling and maintenance	See H&S deliverable. No major safety and environmental risks expected that are not already known from SK and others. CPL prefer a tank design separate from the cavern walls	See H&S deliverable. No major safety and environmental risks expected that are not already known from Borexino and others. CPL prefer a tank design separate from the cavern walls	See H&S deliverable. The main safety risk is accidental rapid boil off of liquid cryogen causing risk of asphyxiation or structural damage. No significant environmental risks foreseen. CPL prefer a tank design separate from the cavern walls
Infrastructure and apparatus required to maintain liquid purity	Determined by MEMPHYS	Determined by LENA	Determined by GLACIER
Infrastructure required to deal with liquid loss from evaporation or boil-off	Determined by MEMPHYS. No major infrastructure required.	Determined by LENA. Likely need for underground storage tanks.	Determined by GLACIER. Likely need for underground storage tanks.
Summary of necessary tank and delivery instrumentation, gauges, leak detection	Determined by MEMPHYS.	Determined by LENA. Extra sensors for organics. Normal instrumentation.	Determined by GLACIER. Extra sensors for oxygen. Normal instrumentation.
Requirement for emergency dumps, bunds, or other extra containments	Determined by MEMPHYS. Probably not needed for water.	Determined by LENA. Assumed that dumps will be needed for emergency and maintenance. CPL prefer free-standing tanks, so provision for protective bund is required.	Determined by GLACIER. Assumed that underground storage tanks will be needed for emergency and maintenance. CPL prefer free-standing tanks, so provision for protective bund is required.
Procedure to maintain	Determined by	Determined by LENA.	Determined by

WP3.3 LAr

2.2 Liquid argon procurement in Europe

In Europe there are several companies able to supply liquid argon but likely no single company in a given country can have the capacity to provide the total amount required by LAGUNA. In this case a collaborative agreement with a lead supplier would likely be needed. Example companies are Linde/ BOC, Air Produts, Air Liquide etc. Different countries can benefit from different local plants and suppliers. For instance in the UK there are potential plants in the Tees industrial area run by BOC and around Hull run by Air Products. In Italy there is the RIVOIRA-PRAXAIR group. The construction of an air separation plant for in-situ LAr procurement is likely not an economically viable project.
Nevertheless, the possibility of having a plant to produce the LAr needed during LAGUNA running is worth considering. This could either be a specific plant located for the project or via an increase in capacity of plants in the area.

2.3 Liquid argon transport in Europe

Transportation options are important and will influence the total cost The requirements for the initial fill are large, corresponding to ~150 tonnes of liquid argon per day over two years. This could be delivered by trucks (≈ 7 trucks per day, 7/7 for two years). To fill the tank would require 4500 trips of 25 tons trucks and would cost around 30 million Euros for transport.

WP3.3 Scintillator

3.2 Methods of procurement of large quantities of liquid scintillator

Currently the LENA collaboration is favouring LAB and laboratory tests have shown that the company Petresa Petrochemicals (belonging to the CEPSA group) can provide LAB of required purity. Petresa's European production plants are in San Roque near the Mediterranean coast of Spain. If this is the chosen supplier then delivery can be achieved relatively easily by ship from the nearest port, Algeciras. The annual production capacity of LAB at San Roque corresponds to 200 kilotons of LAB. Therefore, the minimum duration for the production of 70-90 kilotons is less than half a year. However, filling the detector will need more time, of the order of 1 year. On average, a minimum capacity to accept liquid deliveries of the order of 250-300 tons per day is required.

3.3 Transport to the site - environmental impact, safety, logistical issues

Transport to the sites can be by road, rail and or ship. By road, for instance, two loads a day would require over 2 years to reach the required amount. Use of rail links could allow larger quantities to be delivered per load, but dedicated solvent wagons would be needed. For certain sites where a local rail head is available rail is likely the preferred option. Alternatives include pipelines from nearby plants. For horizontal access 180l containers supplied will fit down shafts of ~2x2x2m. 30 tonne road transporters would imply ~1700 deliveries. Pipeline capacities are typically around 200-400,000 litres per day per pipe. Authorisation, is needed by relevant authorities for the transportation process, but this is straightforward given the large quantities of petrochemical products moved every day in Europe.

Boulby

	Water (1 Mtonne)	Scintillator (50 ktonnes)	Liquid Argon (100 ktonnes)	
Source of liquid, company and status of contacts	**Above Ground**: Yorkshire Water, Environment Agency, North Yorkshire Moors National Park Authority. **Below Ground:** CPL Contacts and discussions with CPL ongoing	Saint Gobain, Zinsser Analytic, Perkin Elmer. Potential Teeside suppliers are: SABIC (was Huntsman) produces cyclohexane and aromatic plastics precursors; Dow Chemical (Rohm & Haas) produces acrylics; Croda Uniquema produces	Contacts established in BOC Gases / Cryoservice Other possible suppliers are: Air Products, Air Liquide UK, Intergas.	
Location of supplier, distance to site		Existing on site at Boulby	Potential Teeside suppliers 30 km away or if necessary the Petresa Petrochemicals company in San Roque, Spain	Suppliers based nationwide but also in Tees Valley around 30 km away
Transportation options and procedures		Pipeline underground is preferred option	Preferred option is by train from local suppliers 30 km away direct to site. Alternatives include road, pipeline from nearby plant and ship to the CPL port 10 km away. 180l containers supplied will fit down	As for liquid argon. Train from local supplier in Tees Valley is preferred. Pipeline underground is feasible.

Liquid Procurement Boulby

G7.2 Industrial Partnership for Liquid Procurement at Boulby

To achieve the proposed Boulby specific liquid argon delivery assessment discussion has started between the following companies:

(1) Air Products Ltd. – UK based company expert in production and delivery of cryogenic liquids in the UK and Europe (also USA and Asia).
(2) Technodyne Ltd. – Design engineers expert in large LPG tank design
(3) CPL – the mine company at Boulby, expert in the logistics of transportation of equipment underground..

(1) potential cost savings from proximity of local supplies of liquid argon from nearby Tees industry and Air Products plants at Hull: The location of Boulby close to existing Air Products and Linde/BOC liquid argon production at Tees, Hull and Carington, plus access to a dedicated port, rail and A-class roads, provide an estimated saving of 30-50% in argon costs over other locations in Europe (AP private communication).

The vast pertro-chemical industry in nearby Tees has several companies that can produce liquid argon and scintillator materials. The mine owns a rail line in that direction. Fig. G7.3.1 shows the proximity of the BOC plant to Boulby, about 30 km.

e.g. Boulby:

Significant work included in WP2, deliverable WP2.8

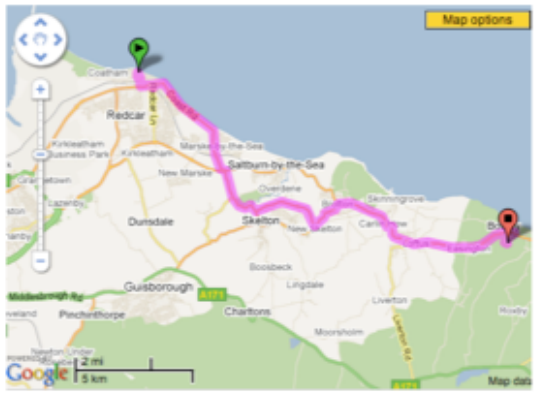


Fig. G7.3.2 Proximity of the Air Products plants to Boulby, Hull is ~150km.

Canfranc

(1) Identify methods of procurement of large quantities (per liquid)

	Water (1 M-tonne)	**Scintillator (50 K-tonnes)**	**Liquid Argon (100 K-tonnes)**
Source of liquid, company and status of contacts	Water from the "*Aragón*" river. Negligible impact. Local Authority for the "*Ebro*" Basin ("*Confederación Hidrográfica del Ebro*"). Positive verbal contact.	A candidate for Liquid Scintillator substance which is used here as a working example is "Linear Alkyl Benzene" (LAB). An apprpriate candidate is the Company "Petresa Petrochemicals" (CEPSA group), which has proven to be able to provide LAB of the required purity. The team in charge of the LSC Feasibility Study has had no explicit contact yet with "Petresa Petrochemicals", however our colleagues most related to the LENA	The team in charge of the LSC Feasibility Study has not explicitly worked in this item. However, the experience from those LAGUNA colleagues who did explore the market, tells that, since the amount of liquid needed is enormous, it is necessary the parallel production from several Factories Europe(World)–wide. Examples of world-wide LArg producers are Air-Liquid, Linde and Air Products.
Location of supplier, distance to site	Basically on site	Petresa Petrochemicals company is located in San Roque, Spain, in the south of the Iberian Peninsula. The distance to Canfranc is approximately 1100 Km of which more than 1000 Km are high way.	Not well established, since there will be more than one supplier to accomplish a reasonable filling time.

Frejus

	Water	Scintillator	Liquid Argon
Source of liquid, company and status of contacts	Water available from the new valley of Susa aqueduct, located nearby the Italian side of the Frejus road tunnel, This aqueduct is under construction and will be operational at the beginning of 2014	Liquid scintillator like LAB (Linear Alkyl Benzene) Potential supplier: Petresa Petrochemicals (belonging to the CPSA group)	Preliminary contacts with potential suppliers (Air Liquide in France, Praxair in Italy)
Location of supplier, distance to site	A few kilometers	San Roque in Spain	France, Italy
Transportation options and procedures	Dedicated pipeline in the road tunnel from the Susa valley (Italy side) to the underground laboratory	Transportation by railway then by trucks for local transfer	Transportation by cryogenic trucks from production site to the detector tank
Production capacity and delivery timescale	3 tanks with 250 000 tons of water each. For example 250 000 tons in 3 months (about 115 tons per hour, 24/24 hours, 7/7 days)	50 000 tons of liquid scintillator Delivery of 250 to 300 tons per day	100 000 tons of liquid argon For example 150 tons per day for 2 years (7/7 days)

PHYÄSALMI

(1) Identify methods of procurement of large quantities (per site, per liquid)

	Water	**Scintillator**	**Liquid Argon**
Source of liquid, company and status of contacts	Water, no contacts at this stage.	Oil, contacts via TU Munich	Argon, no contacts yet
Location of supplier, distance to site	Availability plenty at site	t.b.d.	t.b.d, several factories, that produce
Transportation options and procedures	pipe line	rail via Kokkola harbor	rail via Kokkola harbor or local plant at site
Production capacity and delivery timescale	production (purification) to be set up at site	t.b.d.	local factories may not have sufficient capacity, which favours a local temporary plant
What legal authorization is needed and status of negotiation	Environmental Impact Assessment study to be conducted and to be approved	Environmental Impact Assessment study to be conducted and to be approved	Environmental Impact Assessment study to be conducted and to be approved
Other issues			

Slanic

	Liquid Argon
Source of liquid, company and status of contacts	Contacts established with SC Linde Gaz Romania SRL, Central office: St. Avram Imbroane, nr. 9, Timisoara, Romania Phone: +40256300700 Supplier relationship stage: offer
Location of supplier, distance to site	In Romania, Linde owns the following air separation plants: - Galati, Galati District (on the Mittall Stell platform), located at approx. 200 km from Slanic Prahova - Otelul Rosu, Caras Severin District, located at approx. 450 km from Slanic Prahova - Ramnicu Valcea, Valcea District(on the Oltchim platform) located at approx. 200 km from Slanic Prahova - Timosoara, St. Avram Imbroane street, nr 9(ca mai sus), Timis District, located at approx. 700 km from Slanic Prahova - Cluj Napoca,B-dul Muncii nr 18, Cluj District, located at approx. 550 km from Slanic Prahova
Transportation options and procedures	The following consecutive steps are required when filling the detector tank up to 100%: 1. Producing and storing in Linde tanks of 50,000 tons of liquid Argon 5.0 (99.999% purity and Oxigen content of maximum 2ppm) in the first 2 years from the date the agreement has been signed, delivered at the beginning of the 3rd year under the condition that the beneficiary makes the detector tank available within 2 years of the signing. -within 2 years from signing the agreement, Linde will build the recovery installation - the technical details were determined during a meeting of the parties, in which specialists from Linde Gas Romania and Linde Kryotechnik AG have participated. -also, within this period, the contents of the recovery installation tank will be transferred to the underground tank 2. Producing and delivery of the necessary difference quantity between 2 to 4 years from the initial signing of the agreement. The further addition of liquid Argon in the detector: -the beneficiary will provide a 1000-10,000 ton buffer tank near the detector -transport from the recovery installation tank to the buffer tank -transport of the contents of the recovery installation tank to the

SUNLAB

Umbria

	Liquid Argon
Source of liquid, company and status of contacts	Not possible to provide 100 kton LAr quantity only from one company/one nation: it is whole annual LAr production in Italy → Procurement from whole Europe → Planning of LAr delivery. So far, 2 unofficial meetings with LAr producer (RIVOIRA – PRAXAIR Group) staff → to be planned official meetings
Location of supplier, distance to site	Procurement from whole Europe: transport has influence on final cost A LAr production site is in the nearby: Thyssen-Krupp Terni steel plant – 55 km far – Production: 800 m^3/year (data to be confirmed) – entirely used for steel production need.
Transportation options and procedures	Transportation by trucks. To fill the tank would require 4500 trips of 25 tons trucks and would cost ≈ 30 million Euros for transport. **LAr TRANSPORT INFORMATION** Product Identification Number: 1951 BASIC SHIPPING DESCRIPTION: PROPER SHIPPING NAME: Argon, refrigerated liquid HAZARD CLASS: 2.2 (Nonflammable Gas) IDENTIFICATION NUMBER: UN 1951 ADDITIONAL INFORMATION: PRODUCT RQ: Not applicable SHIPPING LABEL(s): Nonflammable gas PLACARD (When required): Nonflammable gas SPECIAL SHIPPING INFORMATION: Containers should be transported in a secure position, in well ventilated vehicles. The transportation of compressed gas containers in automobiles or in closed-body vehicles can present serious safety hazards and should be discouraged. For air shipments, the "Cryogenic Liquid" handling label must be used in addition to the non-flammable gas (Division 2.2) hazard label on packages and overpacks containing cryogenic liquids.
Production capacity and delivery timescale	First estimate of delivery for initial fill: 150 tonnes of Liquid Argon per day over two years.
What legal authorization is needed and status of negotiation	Issue to be explored and developed.

WP3.3 Draft Status

Basically complete: current version 93 pages
Some editing and text improvements needed

Introduction: complete

Boulby: complete
Canfranc: complete
Frejus: complete
Phyasalmi: ACTION needed
Slanic: complete
Sunlab: ACTION needed
Umbria: ACTION desirable

Deliverable
WP 3.4

Task 13 - Socio-economic

From each site, coordinated together:

Report on the potential socio-economic impact of the construction and operation of the research infrastructure

- local communities will generally directly or indirectly benefit from the presence of a lab yet could also be affected by the construction and operation

-task will attempt to quantify the impact and propose solutions to mitigate any possible negative aspects.

contact with the local governments needed

WP3.4 Report Contents

(1) Stakeholder support, risks, benefits and impact

- Social, economic and political organisations and people relevant to the infrastructure - levels of support, risks and impact
- Table 3.5 collates information on organisations that will be influential in determining whether the infrastructure can or should proceed or not at the site.

Site owners, Environment Agencies, Emergency Services, Planning Agencies, Local Council, Authority. Local Public Transport, Local Mayor, Local MPs, Local MEP, Regional Development Agency, Support from National Scientific Community, Support from Local University Scientific Community, National Science Funding Agencies, Local, Regional, National University political support, Local Schools and Educational Authorities, Local Industry, Philanthropic Support, Other

(2) Socio-economic and environmental impact assessment

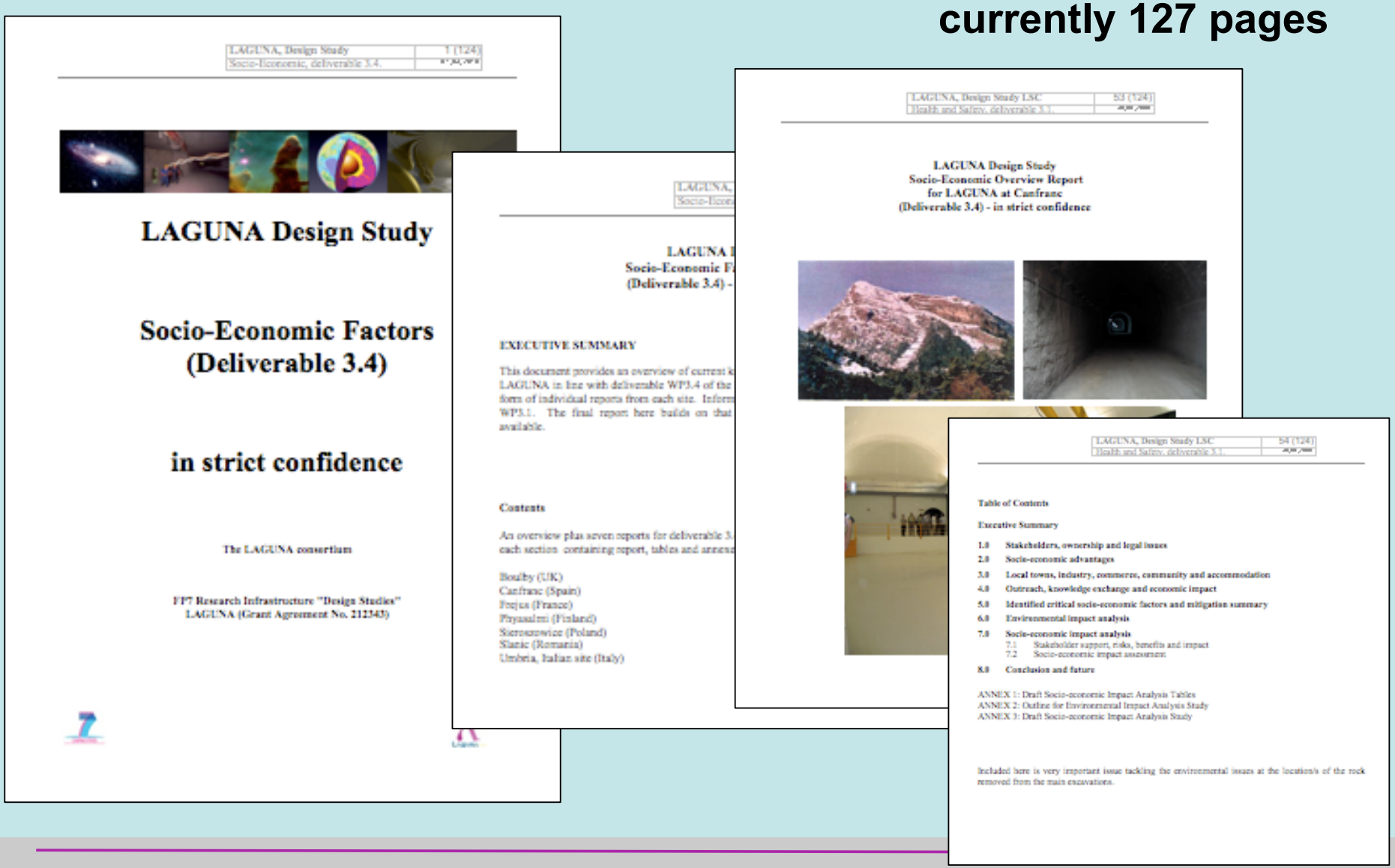
- An assessment of the socio-economic impact that the new infrastructure itself will have
- Table 3.6 collates information on:

job creation, skills and knowledge exchange, economy, environment, local services, local transport, local political profile and status, impact on science for the region and nation, impact on society, schools and education, other impacts

Template tables used - with much information from WP3.1

WP3.4 Status

currently 127 pages



LAGUNA, Design Study | 1 (124)
Socio-Economic, deliverable 3.4.

LAGUNA Design Study

Socio-Economic Factors
(Deliverable 3.4)

in strict confidence

The LAGUNA consortium

FP7 Research Infrastructure "Design Studies"
LAGUNA (Grant Agreement No. 212343)

LAGUNA, Design Study LSC | 53 (124)
Health and Safety, deliverable 3.1.

LAGUNA Design Study
Socio-Economic Overview Report
for LAGUNA at Canfranc
(Deliverable 3.4) - in strict confidence

LAGUNA, Design Study LSC | 54 (124)
Health and Safety, deliverable 3.1.

Table of Contents

Included here is very important issue tackling the environmental issues at the location/s of the rock removed from the main excavations.

WP3.4 (1) Template per site

Template tables used - with much information from WP3.1

Socio-economic Impact of the Research Infrastructure on the Sites

(1) Social, Economic and Political Organisations and People Relevant to the Infrastructure - levels of support, risks and impact

Type of Social, Economic and Political Organisation or Person Involved	Contact Details	Role and importance	Risk, benefit or impact to project	Status of engagement
Site owners	Cleveland Potash Ltd., Boulby Mine, Loftus Saltburn-by-the Sea, Cleveland, TS13 4UZ UK Contact: D. Pybus Tel: +44 (0) 1287 640140 E-mail: enquiries@clevelandpotash.co.uk			
Environment Agencies	British Standards Institution Contact: David.Robinson Tel: +44 (0) 181 996 9000 E-mail: David.Robinson@bsi-global.com			

	Safety Executive HM Inspectorate of Mines, Edgar Allen House, 241 Glossop Road Sheffield S10 2GW Tel: 0114 291 2390		well in hand and understood, e.g. rock disposal is routine at Boulby.	
Emergency Services	Nearest A&E, Marton Road, Middlesbrough, Cleveland, TS4 3BW Tel: 01642 850850 Nearest Fire station: Coronation Rd, Loftus, Saltburn-By-The-Sea, Cleveland TS13 4SW Tel: 01287 640362	In addition CPL provide on site medical and fire services both above and below ground. There is the Cleveland Emergency Planning Unit. CPL hold all the details. There is over 30 years experience in all emergency procdures required for underrground work	**(are these agencies aware of the impact on emergency services?)** Specific discussion on LAGUNA is pending However, in terms of mining activity LAGUNA is not exceptional. The special hazards of liquids needs to be discussed. Risk: low as CPL is well integrated already into emergency services. Impact: the impact of this integration is consequently high.	CPL is well integrated already into emergency services. Other interested parties, STFC, Mine Inspectorate (above), University of Sheffield etc are well integrated.
Planning Agencies	Local council: Redcar and Cleveland. www.redcar-cleveland.gov.uk North York Moors National Park Authority: The Old Vicarage, Bondgate, Helmsley, York YO62 5BP UK Crown Estates: 16 New Burlington Place, London W1S 2HX, UK Tel: +44 (0) 20 7851 5000	For workings under the land planning issues lie with the local authority and local land owner permissions. For workings under the sea the Crown Estates is required.	**(how will planning permission be obtained and what is the risk that it will not?)** Preference is for under-sea sites where the Crown Estates are the prime authority. The Crown Estates is already involved in discussions of LAGUNA and is supportive. Risk: under-land permissions are more complex due to local land ownerships. Impact: CPL are well used to tricky applications; LAGUNA not very abnormal; Crown Estates supportive of LAGUNA	All agencies are well in contact with CPL. Crown Estates is aware of LAGUNA and supportive. CR is a member of the Boulby Science Executive.
Local Council Authority	Local council: Redcar and Cleveland. www.redcar-cleveland.gov.uk North York Moors	As above	**(ditto - any other obstacles, or positive support)** As above	As above

WP3.4 (2) Template per site

(2) Socio-Economic Impact Assessment Summary

This table outlines an assessment of the socio-economic impact that the new infrastructure itself will have.

Impact Item	Impact
Job creation	(how will the infrastructure effect local and national employment during and after construction?)
Skills and knowledge Exchange	(how will the infrastructure, during and after construction, impact on the skills base?)
Economy	(how will the infrastructure benefit the local and national economy in general?)
Environment	(what will be the short and long term environmental impact?)
Local services	(what will be the short and long term impact on emergency services?)
Local transport	(what will be the short and long term impact on roads and local transport services?)
Local political profile and status	(what benefits will there be to the profile of the region and what impact will this have?)
Impact on science for the region and nation	(what benefits will there be to the science profile of the region and nation and what impact will this have?)
Impact on society, schools and education	(what benefits will there be to society, schools and education, e.g. through outreach programmes etc, and what impact will this have?)
Other impacts	

WP3.4 Draft Status

Example for Boulby

LAGUNA Design Study
Socio-Economic Overview Report
for LAGUNA at Boulby
(Deliverable 3.4) - in strict confidence

The University Of Sheffield.

FP7 Design Study:
CPL and University of Sheffield

CLEVELAND POTASH

Table of Contents

ANNEX 1: Socio-economic Impact of LAGUNA at Boulby, Tables 1 and 2

(1) Social, Economic and Political Organisations and People Relevant to the Infrastructure - levels of support, risks and impact

This table collates information on organisations that will be influential in determining whether the infrastructure can or should proceed or not at the site. Priority areas are in yellow.

Type of Social, Economic and Political Organisation or Person Involved	Contact Details	Role and importance	Risk, benefit or impact to project	Status of engagement
Site owners	Cleveland Potash Ltd., Boulby Mine, Loftus Saltburn-by-the Sea, Cleveland, TS13 4UZ UK Contact: D. Pybus Tel: +44 (0) 1287 640140 E-mail: enquiries@clevelandpotash.co.uk	Owners of mine. Responsible for current operations and safety. Support is essential.	**(are all relevant ownership issues clear in law?)** Boulby mine is owned by CPL which is part of ICL. The benefit is strong experience and support for underground construction including access to mining engineers, equipment as well as experience in safety, political and planning issues. Risk: finite lifetime of mine and any conflicts of priorities. These can be mitigated against by sufficient financial backing and partnership. Impact: very high - strong experience and support for underground construction.	Good relations with scientists over 20 years. CPL management closely engaged in development of science and strongly supports LAGUNA and other science. There is a joint executive board involving members from the science community, universities and CPL, with also the Crown Estates (see below).

WP3.4 Draft Status

Example for Frejus

Table of Contents

Executive Summary

Socio-economic Impact of LAGUNA at FRÉJUS site (in the middle of the Road Tunnel), Tables 1 and 2

INTRODUCTION

The installation of one (or more) LAGUNA projects in the ma
at the border between France and Italy, will have a strong socio
regions on both sides of the frontier: Rhône-Alpes/Savoie and
This impa
transportat
winter tim

Some of th
etc), while
impact on

In this co
laboratory
SITAF (Ita

The autho
supporting
(Mairie d
Expansion
Maurienne

SURVEY

The Fréjus
the "Valle
The "Valle
the "Vallé
"Rhone-A
In the pas
Sardaigne)

The "Valle
plants), bu
crossing th

In the recent decades this situation is quite deeply changing
industrial activities (while small size firms are quite well de
custom suppression between France and Italy, with the co
important activities.

As a consequence, a wide conversion to new orientations in the strategy of the economi
in the "Vallée de la Maurienne" started, which is still in progress.
The main orientation is towards tourism, both in winter (ski-stations) and in summer ti
development of the related activities and specific initiatives.

(1) Social, Economic and Political Organisat

This table collates information on organisation
site.

Type of Social, Economic and Political Organisation or Person Involved	Contact Details	
Site owners	SFTRF (France) and SITAF (Italy)	Re op Ac sup and ess
LAGUNA Science sponsors	CNRS (IN2P3) and CEA (DSM/IRFU)	
Environment Agencies	Le Parc National de la Vanoise	No the far
Emergency Services	Firemen at both entrances of the tunnel - Hospital in Modane, at 6 km	
Planning Agencies		
Local Council Authority	Sous-préfet de St Jean de Maurienne	Loc the

(2) Socio-Economic Impact Assessment Summary

This table out

Impact I
Job creation
Skills and knowledge E
Economy
Environment
Local service

(3) Environmental Impact Assessment Summary

Optional extra, the following may help….

Environmental impact is the interaction between humanity and the rest of the biophysical or natural environment, toward the purpose of reducing or minimizing the impacts of human activity, both on the natural environment for its own sake and on humanity itself. Areas of concern in environmental impact include air quality, water quality, global climate change, agriculture, biodiversity, species protection and management of natural resources.

An environmental impact assessment (EIA) is an assessment of the possible impact—positive or negative—that a proposed development may have on the natural environment. The International Association for Impact Assessment (IAIA) defines an environmental impact assessment as "the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made."

Environmental changes can also have a significant impact on the social well-being of the community and resident perceptions about the quality of life in the community.

- What are the sources of environmental disturbance (eg, air pollution, noise, hydrology) for each compenent of the development; ie construction, operations, decommissioning?
- What alternatives that have been considered to ensure that the disturbances are kept to a minimum?
- Will the required energy/fuel be sourced locally or nationally?
- What aspects of the environment may be affected by the development? (For example, populations, fauna, flora, air, soil, water, humans, landscape, cultural heritage)
- Are there any ways to avoid the negative impacts or to keep them to a minimum?

Boulby/Frejus - jobs?

	Excavation phase		Tank construction		Out fitting		Operations
	year 1 (FTE)	year 2 (FTE)	year 3 (FTE)	year 4 (FTE)	year 5 (FTE)	year 6 (FTE)	year 7 + (FTE)
Engineering/technical staff	25	35	60	70	40	40	30
Administrative staff	10	10	30	35	25	25	20
Construction Scientists	5	10	15	15	15	15	10
Operations Scientists	4	6	10	10	15	15	20
User Scientists (national)	4	4	6	6	10	15	20
User Scientists (international)	6	6	6	6	10	20	30
Visitors	10	10	15	15	15	15	25
Indirect local employment	30	30	90	90	110	110	80
Total on site	**64**	**81**	**142**	**157**	**130**	**145**	**155**
Total	**94**	**111**	**232**	**247**	**240**	**255**	**235**

Boulby/Frejus - jobs?

	Excavation phase		Tank construction		Out fitting		Operations
	year 1 (FTE)	year 2 (FTE)	year 3 (FTE)	year 4 (FTE)	year 5 (FTE)	year 6 (FTE)	year 7 + (FTE)
Engineering/technical staff	25	35	60	70	40	40	30
Administrative staff	10	10	30	35	25	25	20
Construc							
Operatio							
User Sci							
User Sci (internati							
Visitors							
Indirect l							
Total on							
Total							

Impact Item	Impact
Job creation	**(how will the infrastructure effect local and national employment during and after construction?)** LAGUNA should provide significant job creation particularly during the 5 years construction and installation. An assessment of direct employment is given in the text, amounting to 100-200 jobs. The gearing with local indirect employment is a factor x 2.
Skills and knowledge Exchange	**(how will the infrastructure, during and after construction, impact on the skills base?)** The skills required for LAGUNA are highly diverse and the opportunities for KE are large thanks to the interdisciplinary nature of the project. A idea of this is given in the text. This can be expected to have a significant impact on the skills base in what is a poor region of the UK. This includes: engineering skills, mechanical and underground mining skills, electronics, cryogenics, computing and support. Increased interaction with university and laboratory people has many advantages. This has already been seen at Boulby, for instance the science approach to health and safety has impacted significantly on the operational approach at Boulby.
Economy	**(how will the infrastructure benefit the local and national economy in general?)** An estimated boost worth £50M geared by a factor 10 is reasonable. This will help secure technical jobs, e.g. for maintenance contracts as well as service jobs, e.g. through accommodation and support services. The attraction of skill workers to the area will benefit the region and help improve, for instance, school standards. At national level the establishment of a major international facility can be expected to boost the UK profile in science, there are few such facilities. The location in the NE of England increases the impact it will have.
Environment	**(what will be the short and long term environmental impact?)** We do not see particularly negative impacts on the environment because as a mine site Boulby is well set up to deal with issues such as rock removal. The fact that the general public do not have normal access near the site means impact there is also minimal.
Local services	**(what will be the short and long term impact on emergency services?)**

Slanic - jobs?

	Excavation		Tank construction			Tank filling		Operation
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 5**	**Year 6**	**After Year 6**
Technical staff	15	15	60	60	40	40	40	30
Admin. staff	10	10	30	30	20	20	20	15
Construction staff	5	5	15	15	15	15	15	10
Operators	4	4	10	10	15	15	15	20
IT staff	5	5	6	6	20	20	20	50
Visitors	10	10	15	15	15	15	15	25
TOTAL	49	49	136	136	125	125	125	150
Temporary workers	120	120	100	100	80	80	80	80
TOTAL	**169**	**169**	**236**	**236**	**205**	**205**	**205**	**230**

Umbria - Environ Impact?

Flow Chart 1 – Assessment if EIA is needed

Request to Regional Council:
1) Preliminary Design, ⇒
2) urbanistic compatibility statement,
3) environmental report.

⇓ (within 30 days / can be extended t

Exclusion

⇓ (within 15 days)

Expression of Regional Council resolution

Flow Chart 2 – EIA procedure

Request to Regional Council (EIA Service):
1) Definitive Design,
2) Environmental Impact Assessment Study,
3) urbanistic compatibility statement,
4) acknowledgment that request has been produced to competent authorities
5) statement that publication (awareness of the design) has been made

(within 30 days) ⇓ ⇒ (within 10 days) ⇒ Documentation forwarded to competent authorities

Observations from population
(forwarded to Regional Council)

(within 15 days) ⇓

Convocation of "Conferenza dei Servizi"
(→ conference of competent authorities)

(within 40 days) ⇓

End of assessment by authorities

(within 20 days) ⇓

Final Report

(within 15 days) ⇓

WP3.4 Draft Status

current version 127 pages

Introduction: complete

Boulby: complete
Canfranc: ACTION needed
Frejus: ACTION desirable
Phyasalmi: ACTION desirable
Slanic: complete
Sunlab: ACTION needed
Umbria: complete

Deliverable
WP 3.2

Deliverable 3.2

3.2	Final report on safety	3	USFD	20	Report	CO	24

A final confidential report defining all safety and environmental issues of the sites

(i) additional infrastructure required for safe operation, in conjunction with the overall safety strategy of the host (road tunnel or mine)
(ii) include possible failure modes of each experiment
(iii) methods by which this risk can be mitigated
(iv) a risk analysis for each site

Task 12 - Final report

subject to commercial confidentiality where appropriate

assessment of:

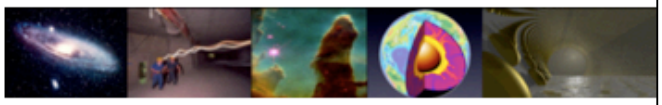
site specific power requirements, installation of additional transformers for AC, ventilation, atmospheric purification, pumping and chiller systems, underground workshops, surface buildings, experimental areas, cranes and associated heavy duty equipment required during construction.

identify alternative ventilation and cooling schemes for tailored cooling of sensitive components such as the heat exchange on compressors.

identify safety considerations:

- **emergency response equipment**
- **air monitoring**
- **egress procedures**
- **hazardous material handling**
- **dedicated ventilation piping for the removal of boil off noble gas, cryogenic coolants, and toxic scintillator vapour**
- **containment systems for scintillator and liquid noble gas spillages.**

WP3.2 Draft Status



LAGUNA Design Study

WP3 Final Report, Safety (Deliverable 3.2)

in strict confidence

The LAGUNA consortium

FP7 Research Infrastructure "Design Studies"
LAGUNA (Grant Agreement No. 212343)

LAGUNA
WP3 Final
(Deliverable 3.2)

2.0 Executive Summary (to be com

2.1 Boulby (operating mine 54°33' N, 0°49

- **Site overview:** More...
- **Stakeholders, ownership and legal issues:**
- **Identified critical factors and mitigation:**
- **Main H&S philosophy and management:**
- **Regulatory guidlines for H&S:** Dedicated.
- **Health and safety risk analysis:**
- (i) Rock excavation, (ii) tank construction a
term issues.
-
- **Environmental Impact:** Mine...

3 Summary of WP3 Safety per Site

3.1 BOULBY

LAGUNA Design Study
WP3 Final Report, Safety at Boulby
(Deliverable 3.2) - in strict confidence

3.1.1 General information

Laboratory general information relevant to safety Boulby is as salt, potash and halite mine located in Cleveland, NE England, run by Cleveland Potash Ltd., a subsidiary of ICL, in continuous operation for 35 years. Currently there are ~900 employees with a further 3000 related employed in the local area. The company has as strong track record of supporting pure science research, first making available caverns in 1989 for the UK's dark matter search programme. This is the only significant underground science laboratory in Europe located in a deep mine site. There is extensive experience of mine-related safety over 35 years, and of deep underground science laboratory safety extending over 20 years. This includes all aspects of excavation, facility construction and operation. For science this includes safety protocols for hazardous gases (e.g. CS_2, CF_4), cryogens (including liquid xenon and liquid nitrogen) and high voltages (up to 100 kV). There is also extensive experience of safety protocols and management mechanisms necessary for developing and performing experiments in a deep mine, covering installation, operation and decommissioning.

Overview of stakeholders and bodies responsible for safety management H&S at the current laboratories, as with all the mine operations, is ultimately the responsibility of the mine manager, working under the UK's Health and Safety Executive (HSE) and mines rules, in tandem with regulations driven by RAL. The key players at Boulby relevant to LAGUNA safety are: (i) CPL Ltd., the mine owners and the parent company ICL, (ii) the bodies associated with planning permissions, including the local authority, National Park and the Crown Estates (responsible for off-shore permissions), (iii) the UK Health and Safety Executive (HSE) and the Mines Inspectorate, which have the ultimate power of closure on safety grounds, and (iv) the science groups University of Sheffield and RAL operated by STFC (Science and Technology Facilities Council) responsible for leading UK involvement in LAGUNA. There is a good relationship between the planning bodies and CPL, particularly the Crown Estates (who have a remit to support science activity).

Health and safety culture and philosophy The base-line mantra for all phases of LAGUNA at Boulby will be zero-tolerance of accidents. This will entail production of a written, safety culture document and guideline detailing all the H&S policies. All parties will be required to agree to this culture and all the associated legal requirements. This will be the "mothering" statement, detailing also the management structure, work plans and safety lines of command. It will include statements that there will be: no deaths, no injuries, no damage to local population, that risk assessments and records are produced for all activities, that all hazards will be identified and risks mitigated prior to work. External visits and audits by experts will be above statutory requirements. An essential part will be recruitment of a CDM (Construction Design and Management) coordinator to be appointed with their legal obligation to include safety issues starting with the design process (see below).

Current and envisaged safety management structures H&S for the current Palmer Laboratory at Boulby has been established with the stakeholders including CPL, STFC, the Universities and users (the only such arrangement in Europe where active science is performed in a working mine). The main bodies and authorities are: HM Mines Inspectorate - power to close Mine; Cleveland Potash Ltd - power to close facility; Boulby Underground Facility Owners & Operators - responsibility to ensure health and safety codes are implemented; Experimental Institute H&S Groups -

WP3.2 Draft Status

Most information available from WP3.1 sections

Just editing and updates expected from all sites

Format: decision to produce a concise summary document similar to that of WP2.8, with ~5 pages per site

Boulby:	**Complete, needs summary**
Canfranc:	**ACTION (use WP3.1 + update)**
Frejus:	**ACTION (use WP3.1 + update)**
Phyasalmi:	**ACTION (use WP3.1 + update)**
Slanic:	**ACTION (use WP3.1 + update)**
Sunlab:	**ACTION (use WP3.1 + update)**
Umbria:	**ACTION (use WP3.1 + update)**

WP3 Progress by Site

Boulby:

WP3.2: ACTION: provide 1 page bullet summary

WP3.3: done

WP3.4: done

Canfranc:

WP3.2: ACTION provide 5 page safety summary and update plus 1 page bullet summary

WP3.3: ok

WP3.4: ACTION needs text and table 2 (I used WP3.1 info, no new info received)

Frejus:

WP3.2: ACTION provide 5 page safety summary and update plus 1 page bullet summary

WP3.3: ok

WP3.4: ok (ACTION you might want to add more)

Phyasalmi:

WP3.2: ACTION provide 5 page safety summary and update plus 1 page bullet summary

WP3.3: ACTION introductory text missing; tables incomplete and no table 5 info

WP3.4: ACTION please provide text, tables are incomplete

Progress by Site

Slanic:

WP3.2: ACTION provide 5 page safety summary and update plus 1 page bullet summary

WP3.3: done

WP3.4: done

Sunlab:

WP3.2: ACTION provide 5 page safety summary and update plus 1 page bullet summary

WP3.3: ACTION provide all text and tables

WP3.4: ACTION no new information provided so I did it, please check

Umbria:

WP3.2: ACTION provide 5 page safety summary and update plus 1 page bullet summary

WP3.3: ACTION provide some introductory text

WP3.4: done

WP3 - Next Steps

(1) Complete WP3.3 and WP3.4, including additional socio economic information (e.g. environmental impact)

(2) Include additional information on liquid purchase, particularly liquid argon (new involvement of Linde/ BOC) - ETHZ?

(3) Assemble and submit final safety overview report WP3.2 (this is somewhat sensitive and requires additonal discussion)

DEADLINE to me Mon 21st March

SUBMISSION Mon 4th April