

GMES

TERRAFIRMA

ESRIN/Contract no. 19366/05/I-EC



S4: Service Partnership Protocol

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V3

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EXECUTIVE SUMMARY

This dossier specifies the protocol by which the *Terrafirma* Operational Service Providers agree to work together during Stage 2. The protocol comprises the minimum set of rules that will enable the partnership to achieve the objectives of Stage 2.

The protocol accommodates a wide variety of imperatives and motives. Partners need to feel that *Terrafirma* will work to their advantage and not restrict their individual imperatives. However, *Terrafirma* is about providing services within a contractual framework, and so there need to be understandings and collective agreements with a minimal set of rules and guides.

The protocol rules are set out in section 3.

It must be stressed that this protocol only relates to Stage 2 of *Terrafirma*.

This dossier is linked closely to *S5: Service portfolio specifications*, *S3: Service Prospectus* and *C7: Service Level Agreements*. An updated version 4 of this dossier will be provided in January 2007.



CHANGE RECORD (version 2 to 3)

Version 1 issued:	01.11.03
Version 1.1 issued:	08.01.04
Version 2:	21.04.04
Version 3 (this version):	23.01.06

Section	Page	Change
Entire document	All	Updated for Stage 2, to reflect in particular the role of the Service Level Agreement which fundamentally changes the nature of the protocol.

ACRONYMS

AP	Associate Partner
CE	Civil Engineer
ESA	European Space Agency
GS	Geological Survey (usually <i>national</i>)
InSAR	Synthetic Aperture Radar Interferometry
IPR	Intellectual Property Rights
OSP	Operational Service Provider
UEB	User Executive Body
VAC	(Earth Observation) Value Adding Company



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1 INTRODUCTION

This dossier specifies the protocol by which the *Terrafirma* Operational Service Providers (OSPs) agree to work. The protocol does not represent rigid rules, but is designed to accommodate a wide variety of imperatives and motives which allows the objectives of *Terrafirma* to be achieved without adversely affecting the day to day business of the OSPs.

Sources of funding are critical to the protocol, as they directly affect the manner in which partners provide services and operate. The protocol is based upon *Terrafirma's* current situation, whereby ESA are providing 100% of the funding for all processing and subsequent value-adding, supplemented by contributions of background IPR of partners (e.g. InSAR results already processed, the use of geo-organisation auxiliary data and knowledge).

Section 2 provides some the structure and names of all current *Terrafirma* partners. Section 3 includes outlines the service provision protocol (originally defined in Stage 1). The remaining sections then follow the headings as specified in the Statement of Work.

This dossier is linked closely to the *S5: Service Portfolio Specifications*, *S3: Service Prospectus* and *C7: Service Level Agreements*.

An updated version of this dossier will be provided in January 2007.



2 PARTNERSHIP

2.1 Terrafirma Partnership mission statement

To develop and provide an internationally-recognised and standardised InSAR-based ground motion hazard information service aimed at saving lives, improving safety and reducing economic loss.

2.2 Partnership organisation and membership list

Organisation	Acronym	Role	Nationality
Nigel Press Associates Ltd	NPA	Project manager, OSP	UK
TeleRilevamento Europa	TRE	OSP	Italy
Altamira Information	AI	OSP	Spain
Gamma Remote Sensing	GRS	OSP	Switzerland
University of Florence	UNIFI	OSP	Italy
Deutsches Zentrum für Luft und Raumfahrt	DLR	OSP and Process validation	Germany
British Geological Survey	BGS	Lead: Product Validation Workgroup	UK
Netherlands Institute of Applied Geoscience	TNO	Product Validation Workgroup	Netherlands
Bureau de Recherches Géologiques at Minières	BRGM	Product Validation Workgroup	France
Arup	Arup	Product Validation Workgroup	UK
CESI	CESI	Product Validation Workgroup	Italy
Euro-Mediterranean Seismological Centre	EMSC	User Executive Body	France
EuroGeoSurveys	EGS	User Executive Body	B
European Federation of Geologists	EFG	User Executive Body	B
SciSys	SciSys	INSPIRE call	UK
Professor Franco Barberi, University of Pisa	FB	Strategy Group Member - Policy	Italy
Professor José Achache, Institut de Physique du Globe de Paris	JA	Strategy Group Member - Science	France
Professor John Burland, Imperial College of Science & Technology	JB	Strategy Group Member - User	UK

The users listed below, all representing national geo-organisations, have completed either a draft or signed Service Level Agreement.

Organisation	Country
Geological Survey of Austria - Klemens Groesel	Austria
Geological Survey of Belgium - Xavier Devleeschouwer	Belgium
Cyprus Geological Survey - Polys Michaelides	Cyprus
Czech Institute of Rock Structure and Mechanics (IRSM-CAS) - Vladimir Schenk	Czech Republic
Soil and Water, Remote Sensing Services - Miranda Saarentaus	Finland
BRGM - Luc Closset	France
BGR - Frederich Kuehn	Germany
BGR - Frederich Kuehn	
University of Athens - Evangelos Lagios	Greece
Geological Survey of Ireland - Koenraad Verbruggen	Ireland



Comune Di Roma - Patrizia Cologgi	Italy
CESI - Giorgio Franchioni	Italy
Unifi - Paolo Farina	Italy
Latvian Environment, Geology and Meteorology Agency - Maris Seglins	Latvia
Lithuanian Geological Survey - Jonas Satkunas	Lithuania
TNO - Chris Bremmer	Netherlands
Polish Geological Institute - Marek Graniczny	Poland
IST-UTL Portugal - Joao Matos	Portugal
Institute of Geology and Mineral Exploration (IGME), Spain - Gerardo Herrera Garcia	Spain
Unifi - Paolo Farina, FOWG	Switzerland

Terrafirma is currently in negotiations with geo-organisations within Denmark, Estonia, Hungary, Luxembourg, Malta, Slovakia and Sweden, as well as more players within countries with existing partners enrolled.

2.3 Partnership decision making, escalation and conflict resolution

During Stage 2, any conflicts arising between partners will be dealt with by the Prime, using ESA as a last resort mediator.

2.4 Partnership commitment towards end users

A key component of *Terrafirma* is the ratification of *Service Level Agreements* with end user organisations as specified by ESA's Statement of Work. Significant research was conducted during Stage 1 to examine the requirements of end users, and this will continue throughout Stage 2 by way of the *Product Validation Workgroup*.

2.5 Entry and exit of new members into the service partnership

Following the success of Stage 1, new *Operational Service Providers* have already entered the service partnership since the service commenced, e.g. Gamma Remote Sensing and DLR. The user-base is also been complemented by an increasing number of geo-organisations, contracted into the project as *Associate Partners*. The *Associate Partner* status is a mechanism to bring additional players into the project as dictated by the *Open Service Partnership Protocol*.

Terrafirma is based upon the concept of service distribution by National Geological Surveys (or national agency equivalents), and so, by definition, such organisations are welcome and indeed encouraged to participate.

For EO VACs to become eligible for enrolment as a *Terrafirma* partner and an Operational Service Provider, they need to fulfil three main criteria:

- They should already be established as a recognised and operational provider of InSAR services.
- They should be able and agree to provide products in accordance with S5: *Service Portfolio Specifications*.



- They should operate a recognisable Quality Control procedure and be ready to comply with the *Terrafirma Quality Control Protocol* when established.

2.6 Drafting the protocol

Within Stage 1, *Terrafirma* quite rapidly arrived at a stage where it was able to start delivering operational services, and partners were beginning to ask legitimate questions concerning service provision mechanisms and basic policy. It became necessary to issue a set of guidelines by which we could progress. The first document was circulated on the 4th July 2003, entitled *Terrafirma service provision protocol (proposed)*. The content is reproduced in Appendix 1. This first document resulted in a number of queries from partners. A second document was therefore circulated on the 4th August 2003, providing clarifications to specific question and adjustments as appropriate. The contents of the second document are also reproduced in Appendix 1. The following protocol is based upon these documents, plus adjustments deemed necessary in the intervening period.



3 SERVICE PROVISION PROTOCOL

The following protocol is based upon the project's current status, i.e. 100% ESA funding for foreground IPR, plus contributions of some background IPR (e.g. InSAR results already processed, the use of GS auxiliary data and knowledge).

Note: OSPs = Operation Service Providers (InSAR service provider).

GO = Geo-organisations (National Geological Survey or equivalent national agency / Civil engineering contractor or consultant specialised in ground motions)

Product levels:

- H-1 : InSAR measurements only (updated every three years).
- H-2 : Causal product (interpreted by GS/CE).
- H-3 : Modelled product (project-based product by GS/CE).
- M-1 : Monitoring product (user-specified, regular updates of H1).
- LSI: Landslide Inventory product
- LSM: Landslide Monitoring product

Key points:

- The results of all ESA funded processing and value-adding will be made available for promotional purposes, and will be accessible via the *Terrafirma* website.
- There is to be no centralised archive of *Terrafirma* products, though the website will make available all meta-data related to processing.
- The service is to be standardised across Europe.
- The expanding number of *Terrafirma* GOs will promote and market the service over their websites.
- The *Terrafirma* website (www.terrafirma.eu.com) will represent the shop window of the project.
- To provide a unified message, partners are to create appropriate links from their websites to the *Terrafirma* site which is hosted and maintained by NPA. The site will have links back to the relevant GSs and VACs.



3.1 Terrafirma protocol

1. Terrafirma service provision is made under the terms of a Service Level Agreement (SLA). Currently there are six different SLA types depending on the type of product being provided:

SLA Type	What for
Type 1	For the provision of H-1 and receipt of an initial interpretation and utility and exploitation reports.
Type 2	For the provision of H-1 and receipt of an H-2 (Causal product, plus other deliverables).
Type 3	For the provision of H-1 and receipt of H-3 (Modelled products, plus other deliverables).
Type 4	For the provision of M-1 and receipt of M-2 (plus other deliverables).
Type 5	For the provision of H-1 and receipt of Landslide Inventory (LSI) product.
Type 6	For provision of M-1 and receipt of Landslide Monitoring (LSM) product.

SLA Types

An example Type 1 SLA is given in Appendix 2.

2. The SLA governs items of relevance to this protocol (please see Appendix for more information):
 - Promotion of products.
 - Conditions of sale of ESA-funded OSP output.
 - Cost of products.
3. There are no territorial limitations imposed on OSPs or other *Terrafirma* partners.
4. All *Terrafirma* products must comply with *S5: Service Portfolio Specifications*.
5. The *Terrafirma* service must be subject to the *Terrafirma Quality Control Protocol* when in place (expected October 2006). Until such time OSPs will use their existing procedures.
6. If an OSP sells an H-1 product that ESA have paid for, another town must be processed in its place by the same OSP.
7. All background IPR is retained by the originator.
8. Credits: The OSP agrees to include at least the following credits and logos on any *Terrafirma* product made by them:
 - The *Terrafirma* logo, and other recognition in a presentation or document that the work is part of *Terrafirma*.
 - The OSP logo.
 - ESA copyright statement for the radar data used, taking the form *ESA data copyright <acquisition year(s) of data used>*.
9. During Stage 2, DLR in consultation with the Prime have the responsibility of verifying the eligibility of new OSPs to join *Terrafirma*.
10. There will be no exclusivity beyond the terms of specific SLAs.



11. InSAR results within a country will point, and have links to, the GO contact of relevance.
If no GO is enrolled, the site will point to the originating OSP for that result.
12. This protocol is not set in stone.

END OF PROTOCOL as at 31 01 06



4 Terrafirma PRODUCTS

4.1 Operations procedures for integrated supply chain

see *S10: Infrastructure Systems Analysis*

4.1.1 Handling and sharing information on end-users

The national geo-organisations are suppliers as well as users. The focus of the OSPs is to supply to these organisations as users and intermediaries. However, most GOs have a client-base to whom they supply geohazard information products. Please see *U2: Key user segment profiles* for a comprehensive description of these downstream users. As OSPs might make individual supply deals (beyond this contract) with the geological surveys who naturally work on a territorial basis by definition, no conflicts are anticipated.

4.1.2 Ordering, handling and tracking procedures

During Stage 2, OSPs order and obtain the required SAR data stacks via the EOPI Cat-1 data agreement. Data is delivered directly to each individual OSP. OSPs are contracted to regularly update the Recipient and the Prime on ordering the processing status as detailed in the obligations to the Supplier within Service Level Agreements.

4.2 Production

4.2.1 Planning of production and quality control

Stage 2 of *Terrafirma* involves a combination of historical (H-1, H-2, H3, LSI) and monitoring (M-1, *potential input to H-2 / H-3*, LSM) products. Production of these fall into two main categories: output of 'raw' InSAR products by the OSP and then output of the downstream value-adders, i.e. GOs. The planning requirement during Stage 2 involves:

'Raw' InSAR product output (H-1, M-1, LSI, LSM)

- site nomination
- order specification and submission
- data transcription and shipping to project OSPs
- processing
- QC on results (geocoding, format, etc)
- Distribution of results to corresponding geo-organisation(s)

Value added product outputs (H-2, H-3, LSI, LSM)

- base map(s) retrieval and integration
- analysis
- specific auxiliary data retrieval and integration
- interpretation
- format
- report



A specific *Terrafirma Quality Control Protocol* is being devised by DLR during the first Phase of Stage 2. In the meantime, OSPs are using their organisation's existing QC procedures (which they all have as part of their qualification as an OSP). A Quality Control sign-off is required as part of the OSP deliverable to Recipients.

4.3 Product distribution

H-1 *Terrafirma* products are to be distributed to Recipient-users as specified in the corresponding SLA relating to that processing. Products are to be made in accordance with *S5: Service Portfolio Specifications*. The Recipients, as national geo-organisations, have their own interests in working on these products, as well as being contracted to actively promote the service both horizontally to other government departments and downstream to their normal end-users. Please note, however, that there is no exclusivity in this arrangement.

The *Terrafirma* website (www.terrafirma.eu.com) includes a 'Cataloguing System' which shows the status of all processing along with all relevant meta-data.

4.4 Pricing and costing rules

Under the current funding regime, *Terrafirma* is not imposing any pricing mechanism on the suppliers or users of the service, though all products have been provisionally costed in terms of the budget allocated to partners. Pricing structures are to be independently negotiated between suppliers and users, i.e. OSPs and geo-organisations.

4.5 IPR

IPR issues have been agreed with all Partners by way of teaming agreements. Basically these agreements state the following: Background intellectual property contributed to *Terrafirma* shall remain the property of the Partner contributing such intellectual property. Intellectual property generated from work carried out under the project shall rest entirely with the generator of such intellectual property unless otherwise dictated by the terms of the ESA contract. Where needed, each Partner and Associate Partner shall grant to other Partners or Associate Partners a non-exclusive, royalty-free, non-transferable licence to use its background intellectual property solely for the purpose of performing the project work and only during the period of time in which the project remains extant.

4.6 Procedures for identifying and prioritising new R&D actions

Though the focus of *Terrafirma* is on operational service provision, it is important to remain aware and open to new science and technology developments which might improve the service. In *Terrafirma* the research element is filled by partners within the team. Besides representing a strong science base on their own, these partners also maintain active links with other recognised research organisations. At this stage of the project no formal procedures have been implemented for identifying and prioritising new research and development.



4.7 Targets, milestones and mechanisms for transaction from public funding to independently funded, sustainable service provision

Terrafirma bases its strategy upon the use and distribution of products by national geological/geotechnical institutes and civil engineering organisations. Part of the logic is that these organisations have the expertise and auxiliary data needed to provide meaningful interpretations for their own initiatives or downstream client-base.

The long-term success of *Terrafirma* relies on the sale of H-1 products either directly to end-users, or through GOs as H-2/H-3/LSI/LSM products. To stimulate this, and 'exploitation' budget is provided to the Recipient to aid promotional activities as part of the SLA terms.

4.8 Annual planning and review processes

During Stage 2, the protocol will be reviewed as often as is necessary and/or at least once a year for the three years of Stage 2. The review process involves: all OSPs, the PVW, the User Executive Body and ESA.

MAIN BODY END - APPENDIX FOLLOWS



APPENDIX 1: DOCUMENTS CIRCULATED TO FORMULATE PROTOCOL DURING STAGE 1.

Please note that some points on the earlier documents have since been revised.

The first document circulated on the 4th July 2003, entitled Terrafirma service provision protocol (proposed).

Terrafirma service provision protocol (proposed). (4th July 2003)

Premise

We have set ourselves the challenging objective of starting to deliver operational services by the end of this August. To allow this, a set of 'ground rules' is needed which allows us to operate whilst accommodating the diverse requirements of the project partners.

This work is in fact the start of the dossier *S4: Open Service Partnership Protocol*. I feel a vital requirement is to keep the protocol simple and clear, to reduce conflict and ease expansion as more organisations are drawn in to the project.

For your information, we are probably well in advance of other GMES projects in our thinking on this.

There can be various scenarios for service provision which are largely dependent upon the source of funding. At one extreme we have the model represented by, e.g. the MARS agricultural monitoring scenario where the EC pay for everything and own all foreground IPR. At the other extreme, we have full commercial services with no public funding. In the middle we have mixtures of the two, e.g. PPP.

The following protocol is based upon our current situation, i.e. 100% ESA funding for foreground IPR, plus contributions of some background IPR (e.g. InSAR results already processed, the use of GS auxiliary data and knowledge). The protocol will undoubtedly need updating to accommodate other funding regimes and issues as we proceed.

Note: VAC = Earth observation value-adding company (InSAR service provider).
GS = National Geological Survey or equivalent national agency.
CE = Civil engineering contractor or consultant specialised in ground motions.

Product levels:

- L 0 : Binary image or vector polygon to show service coverage.
- L 1 : InSAR measurements only.
- L 2 : Causal product (interpreted by GS).
- L 3 : Modelled product (project-based product by GS).

Note there could be sub-levels of Level 1 ranging from coherence maps, point target locations and degraded velocity field maps, to fully detailed results. In general, it is likely that VACs will be unwilling to see Level 1 products freely viewable on websites, except in the case of specific demonstration areas, such as the case-studies made for this purpose on the *Terrafirma* site.



How are we going to do it?

1. A reminder of some key points:
 - *Terrafirma's* aim is to provide InSAR ground motion products through national GSs.
 - Where appropriate, CE organisations may be invited to promote products and be involved with Level 2 and possibly Level 3 products.
 - The service has to be standardised across Europe.
 - An expanding set of *Terrafirma* GSs will promote and market the service over their websites.
2. The *Terrafirma* service needs to look and feel the same across all enrolled GSs. So, rather than the GSs independently create their own *Terrafirma* pages, it is proposed that the pages are compiled by NPA and SciSys.
3. To aid simplicity and reduce the burden on GSs (and VACs), these web pages will be hosted and maintained by NPA with links, from and to, the GS website concerned.
4. The GSs will need to set up a link page from their sites to the *Terrafirma* site. Perhaps NPA will write suggested copy for this, though it is accepted that each GS might have their own corporate requirements.
5. The hosting by SciSys of the relevant *Terrafirma* pages for a given GS will be invisible to the user – they will not be aware they have left the GS site.
6. An appropriate introductory link will be created within the GS website, leading to these pages. This introductory link will be formulated by SciSys in consultation with the GSs concerned.
7. The same site will also be accessible directly through www.terrafirma.eu.com with links back to the relevant GSs and VACs.
8. A prototype of the website pages referred to above can be downloaded from our FTP site at the following URL <ftp://ftp.terrafirma.eu.com>. Login as: <terrafirma> with password: albatross. Download the whole L0_demo folder and access the prototype website through index.htm. Any problems, contact Jennie Cassels. Soon this will appear as a link from the 'partner-only' part of the *Terrafirma* website.
9. To ensure same look and feel, all Level 0 products to be formatted by NPA¹.
 - Binary point target and difSAR coherence polygons are in fact Level 1 products, and generally it is felt they are too commercially sensitive to be freely viewable over the web. Where VACs decide to make them viewable or to show them to potential users, it is suggested they be shown superimposed over Landsat ETM at a scale of 1:50,000 for two reasons:
 - Positional accuracy of point target InSAR precludes larger scale.
 - There is a marketing advantage in not showing any deficiencies in local coverage.

¹ Note, this is no longer the situation as Level 0 products are not being shown on the coverage map of services; merely the corresponding town's name.



10. InSAR results of one country will point, and have links to, the GS contact of relevance.
11. InSAR results of sites in a country with no GS enrolled, will point, and have links to, the originating VAC, or perhaps a CE appointed to fill the GS role.
12. The *Terrafirma* site will represent the shop window of the project.
13. Appropriate disclaimers may have to be drawn up by the GSs that go with *Terrafirma* products as was highlighted by BGS at PM1.

Proposed ground rules

1. All background IPR retained by the originator.
2. During Stage 1, the project management will decide the eligibility of VACs to join. Currently, this is not an issue as all Europe's operational InSAR-for-ground-motion VACs are enrolled.
3. There are to be no territorial limitations imposed on VACs.
4. The *Terrafirma* standard, as prototyped in the first version of *S5: Portfolio specifications*, will only apply to Level 0 and 1 products, not to Levels 2 and 3 which will be the responsibility of the GSs.
5. VACs and GSs, at their own prerogatives, enter into their own independent agreements for service provision.
 - Generally, *Terrafirma* products should not be free, but this will be at the discretion of the originating VAC for L1 and the relevant GS for L2/3. Also, Chris Browitt and others might feel a distinct advantage in freely disseminating some products for promotional purposes (see next point). I have spoken with ESA and they have no policy on any revenues that might be generated from products for which they have funded the processing, i.e. we can sell them if we want to do, and I suggest that until we are told that *Terrafirma* will be fully funded (like the MARS model) this is the option to which we should aspire.
 - The set of case-studies available from the *Terrafirma* website are for free promotional dissemination.
 - L1 sales through GS should give large % to originating VAC (to be independently agreed).
 - L1 sales made independently by the VAC will still provide a return to the relevant country's GS (to be agreed independently by the corresponding VAC and GS).
 - GSs free to charge whatever they decide for *Terrafirma* products beyond L1 agreements.
 - All L2/3 revenue, less L1 component, stays with GS or CE.
 - However, it is possible that Level 3 work will require a budget for further or re-processing by a VAC or for ongoing Corner Reflector InSAR.
6. There will be no exclusivity of service provision by VACs to the GSs.



7. As VACs generate new results, Level 0 versions should be posted onto the Terrafirma and GS (if enrolled) websites – it is, after all, a shop window to the benefit of all. However, if a client demands exclusivity, then usually a premium should be paid. This is at the discretion of the originating VAC.
8. All end products to show *Terrafirma*, corresponding GS, and originating VAC logos.

General comment and open questions

- What kind of organisation of InSAR/GS service providers should we set up?
- How will we enforce performance of service providers in accordance with the entry and exit requirements that will be set out in the Open Service Partnership Protocol?
- Who will eventually decide entry and exit criteria?
- GSs will need to be prepared for enquiries (or even sales). What needs to be done?
- What disclaimers might providing GSs need to compile?

END OF FIRST DOCUMENT

The document above resulted in a number of queries from various partners. A second document was therefore circulated on the 4th August 2003, providing clarifications to specific question and adjustments as appropriate. The contents of the second documents are reproduced overleaf:

SECOND DOCUMENT FOLLOWS



**Response to comments received back on
Terrafirma service provision protocol (proposed) V1, dated 4th July 2003**

Comments received from: Arup, Enel Hydro, BGS, TRE and TNO.

Structure of document: Where a comment has been received on a point, the point has been repeated below in bold, followed in italics by the partners' comment. The clarification then follows the partners' comment. This structure is then repeated for all comments so far received (numbers 1 to 14). There then follows clarification on a number of general comments made (letters 'a' to 'u').

NB: It is not intended to maintain a discussion of this protocol by email much further than these clarifications, as most of the comments raised are dealt with by the fact that distribution agreements between VACs and GSs (or CEs) are to be *independently* agreed. Further clarification will undoubtedly need face to face meetings between the parties concerned.

Before going into detail, let's just recall that the objective of the proposed protocol is not to dictate how any of us run our businesses or activities, but rather to establish a framework that a major funding body such as ESA or the EC will be comfortable with in providing substantial funds to our consortium to undertake wide-scale processing of InSAR for ground motion detection. The protocol does not represent rigid rules; most of the details are open to negotiation between the VAC and GS or CE. Furthermore, if it turns out that Level 1 processing costs have to be met purely by paying clients or VACs have to undertake processing speculatively, then obviously different business and financial criteria will have to apply.

1: Where appropriate, CE organisations may be invited to promote products and be involved with Level 2 and possibly Level 3 products.

Comment: We are not happy about this statement, though we note the "where appropriate" prefix. Levels 2 and 3 are where GSs make their unique inputs and we are not clear what is meant by "CE organisations may be... involved...". We do not recall this being discussed and could not agree to this involvement until we know more about it. If CEs are involved they should be paid by the GS as consultants and have no retained rights in the IPR of any products.

Clarification: The basic premise is for *Terrafirma* products to be distributed by GSs, the incentive to them being the profit to be gained from the additional value they add for L2 and 3 products. The fact that GSs generally hold much of the auxiliary data required for L2 and 3, plus the fact that they have a national standing, accreditation and recognition puts them in a distinct position of advantage over all other players. However, the provision by VACs of products to GSs should not be exclusive for the following reasons:

- The success of InSAR VACs cannot be totally reliant for their success on the performance of GSs.
- We cannot guarantee the participation of a national GS, in which case, corresponding results need to be distributed by someone, and a willing CE is an obvious choice.
- Some customers demand a service of complete confidentiality offered by VACs, thus precluding the involvement of third parties, and sometimes, in particular, public institutions.



- CEs operate on a project basis, and may well have site-specific auxiliary data not available to others, enabling the production of L2 and 3 products.
- Some CEs have expressed a desire to distribute *Terrafirma* products and they should not be precluded.
- If CEs hold information of value to a GS in generating a L2 or 3 product, then of course the CE can be paid as a consultant by the GS.

In any event, and over-riding these points is the fact that VACs are to enter into their own independent agreements with GSs (or CEs), where various conditions, perhaps contradicting some of the points above, are to be negotiated as appropriate. During this Stage 1, it is impossible for *Terrafirma* to be overly prescriptive as we have little or no authority to impose or audit.

2: The service has to be standardised across Europe.

Comment: *We shall need to define more clearly what we mean by 'standardisation'.*

Clarification: Standardisation means that *Terrafirma* customers know what they will be getting whether they are in Ireland or Norway. Specifically, it means that *Terrafirma* products will meet the specifications laid out in dossier *S5: Portfolio specifications* which will define standardisation.

3: The *Terrafirma* service needs to look and feel the same across all enrolled GSs. So, rather than the GSs independently create their own *Terrafirma* pages, it is proposed that the pages are compiled by NPA and SciSys.

Comment: *This refers to the Terrafirma web pages. Any pages related to the website of <GS> will be developed under the responsibility of <GS>.*

Clarification: Correct. Although we offer introductory text and graphics to assist any compilation needed for a 'linking page' from the GS site.

4: To aid simplicity and reduce the burden on GSs (and VACs), these web pages will be hosted and maintained by NPA with links, from and to, the GS website concerned.

Comment: *Links will be maintained by the GSs. We need to define the specifics of the hosting by NPA.*

Clarification: This is understood. NPA and SciSys will shortly be proposing this definition, and showing the proposed system.

5: InSAR results of sites in a country with no GS enrolled, will point, and have links to, the originating VAC, or perhaps a CE appointed to fill the GS role.

Comment: *This needs further discussion. All GSs belong to EuroGeoSurveys (for an extended EU) and/or to Foregs for the whole of Europe. If any GS is left out and replaced by a CE then they will find out.*



Clarification: The intention of the project is to invite and include all GSs (in Europe in the first instance, but also we do not forget the 'G' of GMES, e.g. the USGS is showing an interest in joining, as are Israel and Japan and Russia). If this could be achieved ESA would be very happy. Certainly, if results exist for a town within a country, then that country's GS would automatically be invited to join. Therefore we should never have the situation where an unknowing GS 'finds out'. Furthermore, the Secretary General of EuroGeoSurveys has now emailed all its members about *Terrafirma*. The point is made entirely for the situation where a GS is invited but for some reason does not want to participate, e.g. maybe they demand an untenable exclusivity or would welcome the involvement of some other in-country organisation.

6: During Stage 1, the project management will decide the eligibility of VACs to join. Currently, this is not an issue as all Europe's operational InSAR-for-ground-motion VACs are enrolled.

Comment: We do miss some research-groups in UK, France and Netherlands. Do we want them to participate?

Clarification: The focus has to be on operational service provision. However, we do want a research channel as input so that *Terrafirma* can exploit latest developments, and indeed this is demanded by the contract. Remembering, the original 'team structure' organigram, the 'Research Partner' element was filled by Partners within the team – TNO was included. However, this certainly does not preclude the participation of other organisations, and if there are any suggestions, we can action them, though there are no additional funds available from ESA during Stage 1.

7: There are to be no territorial limitations imposed on VACs.

Comment: This implies that each VAC could compete in every European country – this may have implications for GSs in the obtaining of L1 data to use for L2/3.

Clarification: Exactly. The situation is free-market competition. Providing products adhere to the standards laid-out in S5: Portfolio specifications, the situation is to the advantage of GSs who have the option to negotiate terms as required from different suppliers. Another good reason for including this ground rule is the impossibility of imposing and then policing such restrictions under the terms of this contract.

8: The *Terrafirma* standard, as prototyped in the first version of S5: Portfolio specifications, will only apply to Level 0 and 1 products, not to Levels 2 and 3 which will be the responsibility of the GSs.

Comment: GSs can also join in for Level 0 and Level 1 products.

Clarification: Yes, if they were to prove themselves as an operational InSAR product provider.



9: Generally, Terrafirma products should not be free... ...until we are told that Terrafirma will be fully funded (like the MARS model), this is the option <charging for product> to which we should aspire.

Comment: Agreed but there will need to be a pricing policy that all can live with. Our view is that we (as a GS) should get a return whenever the L2/3 products it has made are sold – either directly or through a viewing service. We assume that we will not have to pay for L1 data to be used in L2/3.

Clarification: Under the current contract it would be impossible to impose a global pricing policy, and we could be accused of price-fixing. We repeat, that the arrangements for each country should be independently negotiated, though it is presumed that the GS should indeed get a return whenever L2/3 products are sold. VACs currently have pricing policies which can easily be adapted.

GSs (or CEs if appropriate) will not have to pay for L1 products until sold either as existing L1 or enhanced L2 and 3.

10: L1 sales through GSs should give a large % to the originating VAC (to be independently agreed).

Comment 1: This is effectively a commission to the GS if it sold an L1 product. The 'commission' would have to cover all costs in making the sale.

Clarification 1: Agreed. Again, amounts to be agreed by independent negotiation between the GS and supplying VAC.

Comment 2: What do you mean by large percentage? Is it that we are forced to ever consult NPA or one of the other VACs and obliged to return to them a prefixed percentage? This will evidently not work, since we are talking about public institutes.

Clarification 2: This really applies where the VAC has to recoup the (substantial) costs of L1 data acquisition and processing. It may less relevant if the L1 products are publicly funded. However, if cost recovery is necessary, even public institutes often pay external companies for collection and processing of data. Many example models exist. However, your question can only be fully answered when we know who exactly is going to fund GMES. Until then we are working on the assumption that Terrafirma products are not free to end-users. The exact business arrangement between a supplier and a GS is to be independently made.

11: L1 sales made independently by the VAC will still provide a return to the relevant country's GS.

Comment: Will need agreement on the %.

Clarification: Exactly, this is something to be agreed between VAC and GS, but if the GS is acting as a 'shop window' then some return to help maintain the website may be appropriate.

**12: All L2/3 revenue, less L1 component, stays with the GS or CE.**

Comment: *Getting the balance between L2/3 and L1 components will require some negotiating. The most difficult point, but a model is for the GS making the sale to recover its costs in actually making the sale and promoting the products then decide what is the relative IPR proportion that the VAC and GS have in the product and divide up the residual return accordingly.*

Clarification: Whilst accepting the importance of this point, we do not want to attempt to impose any rule here which might prove impossible to impose globally. Again, such terms are to be left to the GS and VAC involved.

13: As VACs generate new results, Level 0 versions should be posted onto the Terrafirma and GS (if enrolled) websites – it is, after all, a shop window to the benefit of all. However, if a client demands exclusivity, then usually a premium should be paid. This is at the discretion of the originating VAC.

Comment: *We wouldn't be too happy about a client demanding and being granted exclusivity.*

Clarification: The general intention is for results to be non-exclusive, and all existing non-sensitive results submitted by VACs and those processed as part of the project would have this status (if we proceed into Stage 2, and receive the funding for processing, this would include nearly all 186 towns). However, we have to accept that in some circumstances, and where a result has not already been generated, a client might demand some level of exclusivity, e.g. an oil company trying to measure their liability in terms of subsidence caused. If we refuse, we would simply not do the business, and VACs cannot afford to turn such work away. It's worth remembering, however, that ESA will always own the copyright on the source data, and following any exclusive deal, there is nothing to stop a VAC with the relevant expertise re-processing the result.

14: What kind of organisation of InSAR/GS service providers should we set up?

Comment: *In any case, GSs should be free to enrol with VACs or Universities other than those in Terrafirma, in the development of L0 – L3 products. GSs cannot guarantee exclusivity to any of the VACs of the Terrafirma consortium.*

Clarification: *Terrafirma is not demanding exclusivity of any kind.*



ADDITIONAL COMMENTS MADE

a) GSs are free to end the link to the Terrafirma site or to set-up new links to other sites addressing PSInSAR products.

Clarification: A difficult question, but I suggest that while a GS is formally contracted by ESA, by nature of being in the project, they would have to agree to maintain a link. On the second point, no attempt would be made to limit agreements with others.

b) While we assume that GSs will be selling L1 products, VACs will not be selling L2/3 products.

Clarification: Correct, unless a VAC develops some specific new process, then it is up to the VAC and the GS to negotiate whether this requires validation or endorsement by the GS.

c) Who owns the IPR of L2/3 products? We assume the originating GS.

Clarification: The GS would own the IPR of the enhanced, L2/3 product. They would not own the IPR on the L1 input. The copyright statement on L2/3 product should therefore include the originating VAC (as well as ESA as the copyright holder of the source data).

e) Sales of L1 product would be locally managed / organised (via a VAC or GS) but delivery of sales from the hosted data archive would be managed centrally.

Clarification: We might end up with a hosted central archive in Stage 2 (2-5 years). For Stage 1 however, and for simplicity, it is proposed that this is not the case. As point 5 states above, GSs will not have to pay for L1 product until sale, therefore all L1 product for a particular country could be held by the corresponding GS (or CE) as well as the originating VAC.

f) This would allow VACs to be each paid the agreed same amount per km2 for processing to L1, and an agreed uniform pricing structure to be implemented independent of VAC or sales source. This would be consistent with no territorial limitation on VACs and 'central' control of the processed data (an open service).

Clarification: We do not intend to impose any fixed pricing structure or a central control in this way. Please see point 5 above.

g) I am unclear from the draft as to 'who owns' the L1 data. If the 'raw' data comes to each VAC from ESA free of charge then does the VAC 'own' the data after processing to L1? If so, it could be difficult to offer the data at a 'standard' price and 'standard' copyright/IPR terms. I would suggest that if the data comes from ESA free then the VAC is simply entitled to payment for processing – the L1 data would still remain ESA's.



Clarification: ESA own (and will always own) the copyright on the SAR data. When a L1 product is generated, then the originator would own the copyright of the result – sometimes referred to as ‘image copyright’. Both copyright statements should appear on any L1 product.

h) It is not clear to me which VACs will process data for which areas. The concern could be that if agreement is not reached with one of the VACs, that later the data they have processed may become unavailable to Terrafirma.

Clarification: It is up to VACs and GSs (CEs) to negotiate their own agreements as they see fit (a free and competitive market). Even if an agreement is not made before the processing of a result, the originating VAC should still want to put their result onto the *Terrafirma* ‘shop window’ (website) as this is free publicity. This point is, however, largely academic as all European operational InSAR VACs are in the project.

i) It is not clear to me what the ‘advantage’ of being a ‘partner’ VAC as opposed to an ‘associate partner’ VAC will be. Logically all should be paid the same to process data to L1, maybe the only difference would be that a ‘partner’ VAC would be guaranteed more processing work than an ‘associate partner’ VAC.

Clarification: There is no advantage to being a Partner VAC as opposed to an Associate Partner VAC in the longer term – they are equal in all ways. The contractual difference is that the Partner VACs, i.e. those included in the original bid submission, are formally contracted by ESA and benefit from some ESA funding. In Stage 2, this will equal out into a level playing field. Associate Partner status is purely a mechanism to bring other players into the project as dictated by the Open Service Partnership Protocol. Incidentally, all new players brought into the project, not just VACs but GSs and CEs as well, have/will have Associate Partner status.

j) Are you going to allow the GSs to compete with each other and with VACs for sales in the same countries? To promote uniformity of the team I would suggest that ‘sales areas’ for each GS/VAC for the L1 product and a single pricing structure with standard terms of sale defined. The % payable to the sales company should be standardised.

Clarification: We are not going to attempt to stop competition, though the situation where one country’s GS is undertaking work in another country where a GS exists that could provide the same service seems unlikely. We do not plan to impose any territorial limitations on VACs, therefore no ‘sales areas’ imposed by *Terrafirma* – these to be decided by independent negotiation between GSs and VACs.

k) How are ‘central’ management costs of running Terrafirma to be met? I would suggest that part of the sale covers the VAC processing, part the sales company and part the ‘central management’ overhead. This sort of ‘deal’ is envisaged in ‘standard’ Joint Venture agreements.

Clarification: For Stage 1 and Stage 2 (5 year timeframe), ESA will pay. Until we have some idea as to who will pay for GMES overall, the question cannot be answered any further, and this is still being deliberated by the EC. It is envisaged that any profit made from products



100% funded by ESA (e.g. current L1 processing underway) would be put back in to increase the service coverage (this does not include L2 or 3), but this needs further discussion with ESA.

l) Within GMES, Terrafirma wishes to create a space-based monitoring system for surface deformation phenomena. At this moment, no 'new products' have been defined apart from "DInSAR data", and Geological Surveys do not seem to be ready to add further content.

Clarification: No 'new' products have been created, but we have defined a set of standards for these products which is important for the good understanding for clients and for the standardisation of the service. We did have to back away from risk assessment which might be disappointing for some, but the reasons are justifiable and have been fully explained.

It is not understood where the last point of this comment comes from as GSs are as ready as they can be right now to begin adding value to InSAR products when services begin, as defined by the auxiliary data listing that GSs might use and associated commentary presented in the dossier S5: Portfolio specifications.

m) VACs are free to create their own distribution network; any agreement with GSs should be "non-exclusive", as written. Exclusive distribution agreements of VACs with other companies on the territory generate conflicts with the GS. Should the VAC then pay both GS and the partner?

Clarification: If a VAC already has an exclusive agreement with a non-GS distributor in a country, then the option is open for another VAC to make an agreement with the GS. The corresponding GS should not be overly concerned about this 'competition' in their home market because of the issues made in point 1 above.

n) Each partner should get revenues proportional to the value added to the final products. Only if GSs add value (even to L1 products like formal acceptance of the data, a "validation stamp", etc.), VACs could pay GSs a commission. This minimal commission cannot be greater than 5-10%, within the framework of the general distribution agreement of the Territory, for a "non exclusive business procurement action".

Clarification: See response to point 11 above.

o) If, besides the InSAR results, no further validation or hazard/risk-map is generated, there is no need to provide to Terrafirma central GIS other than Level 0 data (the positions/extension of the areas covered). This central GIS would act only as a marketing tool for some European VACs. The level 1 data should be delivered on a need to know basis, after a formal request of the customer or of the GS.

Clarification: There will be no risk map, but the options of an interpreted product (L2) and a modelled product if possible (L3). During Stage 1 there does not seem to be any necessity to centrally archive L1 results. However, GSs with an agreement with a VAC should be allowed



to have L1 results for their own validation and preparation of enhanced products on the strict understanding that no operational or commercial use is made of the result without payment to the VAC (to be covered by independent agreement).

p) We [a CE] certainly have a capability to sell EO services in [various countries]. It is not clear how we should proceed. Do we need an appointment from Project Management (according to item 11 of your protocol)? How freely can we decide charges to final client?

Clarification: You do not need 'an appointment' from the project management. As stated, besides standardisation of products and a central *Terrafirma* 'shop window', Europe represents an open and free market. It is therefore up to you to make an agreement with an appropriate VAC for your distribution and pricing of product.

q) As processing is so far entirely paid by ESA, what is the approximate level of cost to be charged (full cost, 50% 20%). We cannot proceed in a random way, otherwise clients of a GS/CE may complain to have been charged something that others got almost for free from another GS/CE. It seems on the other hand that you suggest that such decisions depend entirely on a commercial negotiation between the processing VAC and the promoting CE/GS. Can you confirm?

Clarification: What you say is confirmed. We cannot price-fix and have no mechanism or jurisdiction to impose a European pricing policy. The fact that ESA have paid for some processing should be considered as irrelevant as considerable confusion could unfold with different pricing structures for different datasets, where the message to customers needs to be clear and unambiguous. We do not envisage scenarios where some VAC/GSs provide products almost free (beyond some promotional products which are encouraged). Though pricing structures might vary, realistic prices should always be paid by end-users.

r) Which is the rational for profit sharing? In case of full cost charging, your protocol indicates that VACs will be paid approximately twice, while GS/CE can overcharge what they are able to.

Clarification: While ESA are funding the exercise, profits should go back into the processing and generation of more service coverage. Charges made by GSs/CEs for L2/3 are up to them and kept by them.

s) In countries where there is a GS already, what is the possible role of CE's (e.g. Atkins in UK)

Clarification: This is dependent upon independent agreement between the parties concerned.

t) The roles of NPA and SciSys in webpage posting are not clear.

Clarification: There is considerable ongoing activity between NPA and SciSys on the development of relating web-pages and links and progress has been fluid. SciSys is assisting



in design and technical issues while it now seems more appropriate for NPA to actually host the site and pages. As stated in the previous document, we are proposing a 'link-page' from the GS (or CE) websites which will contain introductory material and a link to the main *Terrafirma* website hosted by NPA. There will be two routes of entry into the Terrafirma site – from the GS/CE where the visitor, after clicking the link from the GS/CE site, will arrive at the corresponding country coverage (one level down from the European coverage), and direct into the site at European coverage level.

u) The name VAC is not very clear (also I expect everybody to "add value").

Clarification: The acronym 'VAC' meaning 'Value Adding Company' is a term very commonly used in the Earth observation (EO) industry to describe organisations who add value to EO data. It is the term that ESA use and understand. Apologies for any confusion as it is indeed appreciated that GSs and CEs both add value in their own ways.

APPENDIX 1 END



APPENDIX 2: EXAMPLE SERVICE LEVEL AGREEMENT

Terrafirma Service Level Agreement TYPE 1

This agreement is made between

the provider of the *Terrafirma* H-1 product, known hereafter as the SUPPLIER,

the

the user of the *Terrafirma* H-1 product, known hereafter as the RECIPIENT,

and

Nigel Press Associates Ltd (NPA), the Project Co-ordinator.

Introduction

This Service Level Agreement (SLA) has three functions:

- To ensure quality of the *Terrafirma* product delivered.
- To ensure a minimum level of feedback from the RECIPIENT and downstream users.
- To stimulate investment for more processing and interpretation within a country.

Terrafirma will fund the processing of the SAR data listed below to generate an H-1 product as specified in the *Terrafirma* dossier *S5: Service portfolio specifications*, available from the *Terrafirma* website at http://www.terrafirma.eu.com/partners_only/dossiers/Supply/S5.pdf

Terrafirma will also provide the RECIPIENT €7,500 towards the horizontal and/or downstream exploitation of the product, e.g. presentations made to local and central public authorities.

The provision of a *Terrafirma* H-1 product places contracted obligations on both the SUPPLIER and the RECIPIENT of the product, as described in this document. By signing this SLA, both the SUPPLIER and the RECIPIENT agree to abide by these obligations.

Site information

Town/Site	
Country	
Contact	
Geo-Extents of PSI processing	
*ERS-1/2 SAR scenes available / from-to	
*ENVISAT ASAR scenes available / from-to	
*Total SAR scenes available for processing	

* to be completed by NPA



- **Justification for H-1 processing of this site**

Reasons for site selection:

In situ and other complementary data that will be used to interpret the H-1 product:

Exploitation work to be done:

Sources of additional non-R&D funding to be explored:

Restrictions on exploitation of the output by *Terrafirma*:



Preamble

- A.1: This Service Level Agreement is subject to revision by the European Space Agency.
- A.2: This SLA is concerned with the delivery of the standard 'H-1' *Terrafirma* product, this being the 'raw', but quality-controlled, geo-referenced, Persistent Scatterer InSAR output from the InSAR providers. H-1 products are made from integrations of radar data acquired by three ESA missions; ERS-1 (91-96), ERS-2 (95 - present), and ENVISAT (01 - present), giving motion measurements from 1991 to the most recent *routine* acquisition.
- A.3: The Project Co-ordinator (NPA) is responsible for the ratification of the SLA between the SUPPLIER and the RECIPIENT before any data is ordered or processing begins.
- A.4: A copy of all ratified SLAs must be passed on to NPA within seven days of signing for compilation into the *Terrafirma* dossier *C7: Service Level Agreements*.
- A.5: The terms of the SLA are liable to revision by consensus between ESA, the *Terrafirma* User Executive Body and Operational Service Providers.

Contacts

SUPPLIER

RECIPIENT

Project Co-ordinator

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Contractual Manager

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Obligations on the SUPPLIER

- B.1: **Service specifications:** The SUPPLIER guarantees that the product supplied fully complies with the H-1 product specifications as given in the current version of the *Terrafirma* dossier *S5: Service portfolio specifications*
http://www.terrafirma.eu.com/partners_only/dossiers/Supply/S5.pdf
- B.2: **Quality control:** The SUPPLIER agrees to ensure that the product supplied has been signed-off against the *Terrafirma* Quality Control procedure. A copy of the Quality Control sign-off will be provided along with a Processing Summary to both the



RECIPIENT and *Terrafirma* Project Co-ordinator at the time of the H-1 product delivery.

- B.3: **Service availability:** The acquisition and accessibility of appropriate SAR data are the main components of the supply chain that can affect the primary availability of the service. SAR data is normally available to the SUPPLIER within 14-21 days of data ordering providing the data is already held in ESA archive (which covers all Europe).
At all stages, the SUPPLIER agrees to keep the RECIPIENT fully informed of progress along the SAR data supply chain.
- B.4: **Delivery lead time:** The SUPPLIER agrees to make all best effort to ensure that the service is delivered to the RECIPIENT within 6 weeks from the SUPPLIER's receipt of the SAR data necessary for the processing. This is measured by progress checks implemented within the Quality Control procedure. A brief progress email will be sent to the RECIPIENT every two weeks. Any delay to the anticipated delivery date will be reported to the RECIPIENT within forty-eight hours.
- B.5: **Sale of products:** If the specified *Terrafirma* product is sold or used operationally (which is actively encouraged!), then a negotiated agreement should be made between the SUPPLIER, the RECIPIENT and the Project Co-ordinator to cover the terms and conditions of a commercial sale. As ESA have funded the initial processing and data procurement, it is expected that an element of any profits made will be re-invested in *Terrafirma* towards the processing of a new site. The Project Co-ordinator must be notified if any such sale is made.
- B6: **Technical support:** The SUPPLIER agrees to ensure that any reasonable technical support or help is provided if needed by the RECIPIENT to fully utilise the service.

Obligations on the RECIPIENT

The RECIPIENT agrees to provide back to the *Terrafirma* Project Co-ordinator the following four deliverables:

1. Product Acceptance Report. To download the Product Acceptance Report template, visit:
http://www.terrafirma.eu.com/partners_only/dossiers/PAR.pdf
2. Utility Report. To download the Utility Report template, visit:
http://www.terrafirma.eu.com/partners_only/dossiers/UR_template.pdf
3. Exploitation Report. To download the Exploitation Report template, visit:
http://www.terrafirma.eu.com/partners_only/dossiers/ER_template.pdf
4. Initial interpretation with PowerPoint.



Terms relating to Recipient deliverables:

- C.1: **Product Acceptance Report:** This form is to be completed by the RECIPIENT to check that the received H-1 product conforms to the Validation Protocol specified in dossier *C5: Validation Protocol*, available as a PDF from:
http://www.terrafirma.eu.com/partners_only/dossiers/Common/C5.pdf
- C.2: **Utility Report:** The RECIPIENT agrees to provide a report (see example and template) on the technical usefulness of the product. The purpose of this feedback is to aid the future development and refinement of the *Terrafirma* service. Utility reports will be compiled by NPA into a dossier *U7: Utility Reports* which is a deliverable to ESA.
- C.3: **Exploitation Report:** The RECIPIENT agrees to provide a report (get template from: http://www.terrafirma.eu.com/partners_only/dossiers/ER_template.pdf) on the exploitation of the H-1 product. This report should state what was done to promote, exploit, use and further expose your *Terrafirma* product to other important public and private sectors within your country to help stimulate further demand. Such entities might include national utility operators, engineering consultancies, regional development and planning agencies, environmental agencies, transport operators, extractive industries and policy validation. This activity should not be limited to entities just within the geographic area covered by the H-1 product, as the intention is to stimulate a national interest. It is expected that a minimum of three or four such contacts and presentations are made.
- Please ensure to record and include 'value statements' from users for use in a second version of the *Terrafirma* Atlas (collection of results, interpretations and value statements).
- C.4: **Initial Interpretation:** It is expected that the RECIPIENT makes some effort to interpret the H-1 product with a view to explaining any ground motions observed. A brief, written Initial Interpretation, together with a supporting PowerPoint presentation must be submitted to the Project Co-ordinator within 9 months of receipt of the H-1 product.
- C.5: **€7,500 will be paid by the project to the RECIPIENT for the activities described in C3 and C4 after acceptance by the Project Co-ordinator.**

Terms of payment: The €7,500 will be paid by NPA to the RECIPIENT in a single instalment within 90 days of NPA's receipt and acceptance of the deliverables described in C1 and C4. Any non-compliance will be notified by NPA within 14 days of receipt.



- C6: **Time-frame:** The RECIPIENT agrees to provide back the stated deliverables to the Project Co-ordinator within the following time-frames.

Deliverable	Delivery time-frame
Product Acceptance Report	within 2 weeks of receipt of H-1
Utility Report	within 9 months of receipt of H-1
Exploitation Report	within 9 months of receipt of H-1
Initial Interpretation	within 9 months of receipt of H-1

Deliverables schedule

- C.7: **Website link:** The RECIPIENT agrees to provide a link to the *Terrafirma* website from an appropriate position within their organisation's website within 3 months of receipt of the Level 1 product. An email shall be sent to the Project Co-ordinator announcing the link at this time.
- C.8: **Restrictions on use:** The RECIPIENT agrees that the H-1 product as provided is used only for non-commercial purposes. The product can be used commercially (and is encouraged), but only after the negotiation of terms between the SUPPLIER, the RECIPIENT and the Project Co-ordinator. The Project Co-ordinator shall be informed as such situations arise.
- C.9: **Credits:** The RECIPIENT agrees to include at least the following credits and logos on any product derived from the supplied H-1 product:
- The *Terrafirma* logo, and other recognition in a presentation or document that the work is part of *Terrafirma*.
 - The logo of the organisation who made the H-1 product being used.
 - ESA copyright statement for the radar data used, taking the form *ESA data copyright <acquisition year(s) of data used>*.
 - The logo of the RECIPIENT.

General terms

- D.1: **Publicising results:** ESA retain all rights to exploit the output from this project, e.g. H1 products and interpretations. These rights will extend to any data or information used or owned by the RECIPIENT (or other third parties) in their interpretation or presentation of the result if the RECIPIENT does not express precise or justified restrictions on ESA's right of use and dissemination. Any such restrictions or indeed associated terms of use should be documented and attached as Appendix 1 to this agreement prior to signature. However, please note that, in general, ESA wish to promote the *Terrafirma* service and will want to publicise results, particularly interesting interpretations which help validate the product. In such cases, permissions will always first be sort and credits given as appropriate.
- D.2: **Complaints:** In the event of any failure to meet these obligations, or any related dispute or complaint between the SUPPLIER and RECIPIENT of *Terrafirma* products, the matter should first be put before the Project Co-ordinator for resolution. Such matters should be presented by email to the Project Co-ordinator and copied to the Contractual Manager, whereby the complaint will be acknowledged immediately and



then entered in the general *Terrafirma* Actions Database. All best effort will be made by the Project Co-ordinator to resolve the matter within 14 days.

- D.3: **Limits of SUPPLIER warranty:** The foregoing provisions represent the entire liability of the SUPPLIER in respect of a defective H-1 product. All other conditions, warranties of any kind, written, oral, statutory, expressed or implied by statute or common law with respect to the *Terrafirma* product including but not limited to the implied warranty of satisfactory quality, merchantability and fitness for purpose are hereby excluded.
- D.4: **Consequential damage:** The foregoing provisions state the entire obligation of the SUPPLIER with respect to the H-1 product, and in no event shall the SUPPLIER be liable in any way for any loss of profit, loss of turnover, economic or consequential loss suffered by the RECIPIENT (or any of his horizontal or downstream users) arising directly or indirectly from this contract.
- D.5: **Force majeure:** The SUPPLIER shall not be liable for any failure to perform their obligations arising from circumstances outside their control including but not limited to acts of God, war, riots, terrorist activities, civil disturbance, explosions, fire, floods, unusually severe weather, strikes, acts of government or of any authorities, delay by suppliers, accidents and shortages of materials, labour or manufacturing facilities.
- D.6: **Arbitration:** Any dispute arising under or in connection with these conditions or the provision of a *Terrafirma* H-1 product, if unresolved by the Project Co-ordinator as in Clause D.1 above, shall be referred to arbitration by a single arbitrator appointed by agreement or (in default) nominated on the application of either party. The law of the SUPPLIER's country shall apply to this SLA, and the parties agree to submit to the exclusive jurisdiction of SUPPLIER's country's courts.
- D.7: **Termination:** If the SUPPLIER or RECIPIENT defaults in or commits any breach of any obligations to the other party, the offended party shall have the right forthwith to terminate the SLA in whole or in part. Such a termination shall not prejudice or restrict the rights or remedies of either party. In the event of termination, both the SUPPLIER and the RECIPIENT agree to pass back any data exchanged by way of this SLA.
- D.8: **Disclaimer:** With respect to any document or data provided under this SLA, neither the SUPPLIER nor the RECIPIENT, nor any of their employees, make any warranty, expressed or implied, including the warranties of merchantability and fitness for a particular purpose, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, product or process disclosed, or represents that its use would not infringe privately held rights or affect land or property values.



Last, but not least, the Terrafirma project team is grateful for your participation in the development of this unique and valuable new service. Please do not hesitate to ask for any kind of assistance whatsoever with any aspect of the work.

SIGNED BY

SUPPLIER
SIGNATURE

RECIPIENT
SIGNATURE

NAME

NAME

ORGANISATION

ORGANISATION

DATE

DATE

PROJECT CO-ORDINATOR

SIGNATURE

NAME

DATE

APPENDIX 2 END

END OF DOSSIER
