NGTS

REPORT

Norwegian GeoTest Sites (NGTS)

PROJECT EXECUTION MANUAL

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Summary

This project execution manual should be used as a basis for all work performed as part of the Norwegian Geo-Test Sites project (NGTS). The project is based on the reviewed proposal submitted to The Research Council of Norway (RCN) on 20 May 2016. The main objectives of the project are to develop five (5) National GeoTest Sites in Norway as field laboratory for testing and verifying innovative soil investigation and foundation methods and solutions. The sites cover a range of typical soil conditions, soft clay, silt, sand, quick clay and frozen soil (permafrost). The Norwegian Geotechnical Institute (NGI) and its partners, the Norwegian University of Science and Technology (NTNU), SINTEF, the University Centre in Svalbard (UNIS), and the Norwegian Public Roads Administration (NPRA) will be responsible for the development of the sites. The project period is to run for three years, commencing on June 1 2016. The long-term goal is five sites for users in Norway and abroad operative for at least 20 yrs. The project manual will be revised after the Steering Committee meeting in January each year, in order to update the document with recent developments and provide more information on the activities that will be taking place over the subsequent year.

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Review and reference page

1 Introduction

This project plan describes the work planned for RCN's infrastructure project "Norwegian Geo-Test Sites (NGTS)" (*Nasjonal forsøksfelt*). The project is based on the Project Proposal submitted to the RCN on 20 May 2016 and on the contract signed on 05.12.2016. The project is to run for three years, commencing on June 1, 2016. The project manual will be revised after the Steering Committee meeting in January each year, in order to update the document with recent developments and provide more information on the activities that will be taking place over the subsequent year. NGI is the coordinator of the NGTS project and has the overall management responsibility, with NTNU, NPRA and UNIS-SINTEF as partners in the RCN project.

This document presents the organisation, budget and progress schedule for NGTS. It also briefly describes the basic principles for project execution and quality control in the project. NGI's quality assurance system is certified according to ISO 9001 and has an environmental management system certified to ISO 14001. NGIs environmental and soil mechanics laboratories are accredited to ISO 17025. More information NGI's Internal Control system can be obtained from the Project Manager.

1.1 Background

Benchmarking is of significant importance in geotechnical engineering for testing and verifying innovative soil investigation methods and foundation solutions. However, an important challenge to geotechnical engineers is that historical benchmark sites often are lost due to urbanization and other development. Scientists and engineers are thus often allowed too short time to conduct scientific research on specific soil materials. For the period 2016-2019, NGI and its partners, NTNU, SINTEF, UNIS and the Norwegian Public Roads Administration (NPRA) have received funding from The Research Council of Norway (RCN) to develop a Norwegian GeoTest sites research infrastructure. Thin investment in a geotechnical research facility is unique, and the test sites will be available for at least 20 years (maybe 10 years in the case of the Svalbard site).

Throughout the three-year of the RCN period, five national test sites will be developed as field laboratories covering a range of typical soil conditions, soft clay, silt, sand, quick clay and frozen soil (permafrost). The industry, public authorities, research organizations and academia worldwide will have the possibility to use all five sites as benchmarks to test new soil investigation methods and foundation solutions, and develop soil models. Part of the project is also to establish an informal network among international test sites, in this way it will be possible to exchange information for a wide range of soil conditions worldwide.

1.2 Project objectives and subsidiary goals

The objective of NGTS is to develop five national field laboratory for testing and verifying innovative soil investigation and foundation methods. The focus of the infrastructure will be on:

- Soil investigation tools and methods: sampling, *in situ* testing and laboratory testing.
- Testing of new and/or unique instrumentation/monitoring schemes.
- Fundamental understanding of soil behavior and interpretation of soil parameters from laboratory and *in situ* tests.
- Development of innovative and cost-effective foundation solutions for onshore and offshore applications.

2 Description of work

2.1 Scope of work

During the first three years of the NGTS project (i.e. from 2016-2019), focus will be on full geotechnical characterization of the selected sites, purchase of equipment and on establishing the necessary site infrastructure for future use of the sites, including model testing. Establishment of the infrastructure includes, for example, installation of permanent in situ equipment (e.g. piezometers, thermistor strings and pressure cells), electricity and water supply to the site and climate stations.

2.2 Main activities

Table 1 presents the key milestones for the infrastructure project. The RCN infrastructure project will start in June 2016, and go over three years. In Table 1, the bold text presents a main activity (e.g. Item 1 Acquisition of equipment) related to the deliverables listed under the main activity (e.g. Items MP1.1 to MP1.3. where MP stands for milestones). Each item listed in Table 1 (denoted as MP*n.n*) represents a deliverable. The estimated costs for each main activity and date of completion for each milestone are also shown. The partners having already agreed on task responsibility and budget attributions. The test sites in clay, sand and permafrost have been identified, although some verification still needs to be made, and agreements about the long-term use of the sites need to be made.

The project plans to hold a workshop every year and an international conference at the project end. Site verification, soil characterization and the setting up and early work with the database and the web site will be done in the first two years. Wrapping up, completing basic documentation for future use of the national test sites and the finalisation of the database will be completed during the last year.

Table 1: Milestones, project plan and associated costs on macro scale for NGTS.

MP No.	Main activity and deliverables, including milestones (MP)	Total costs[a] (MNOK)	MP completion
1	**Preliminaries (5 sites)**		
MP1.1	Project execution manual	0.5	June 2016
MP1.2	Unified *insitu* and laboratory procedures		Sept. 2016
MP1.3	General site procedures and HES		Sept. 2016
2	**Acquisition of equipment**		
MP2.1	Laboratory equipment	10.5	Continuously
MP2.2	Permanent and in situ testing equipment		Continuously
MP2.3	Guidelines for use of equipment		Jan. 2019
3	**Silt Site**		
MP3.1	Screening tests completed – Site selection	5.5	Nov. 2016
MP3.2	Contract signed with landowner		Dec. 2016
MP3.3	Site preparation completed (utilities + permanent installation)		Sept. 2017
MP3.4	Site characterisation – completed		Nov. 2018
MP3.5	Final geotechnical characterization report		Jan. 2019
MP3.6	Site ready for operation phase, including conditions for use		June 2019
4	**Sand Site**		
MP4.1	Screening tests completed – Site selection	5.5	Nov. 2016
MP4.2	Contract signed with landowner		Dec. 2016
MP4.3	Site preparation completed (utilities + permanent installation)		Sept. 2017
MP4.4	Site characterisation – completed		Nov. 2018
MP4.5	Final geotechnical characterization report		Jan. 2019
MP4.6	Site ready for operation phase, including conditions for use		June 2019
5	**Permafrost Site**		
MP5.1	Screening tests completed – Site(s) selection	6	Nov. 2016
MP5.2	Agreement with local authorities		Dec. 2016
MP5.3	Site preparation completed (utilities + permanent installation)		Sept. 2017
MP5.4	Site characterisation – completed		Nov. 2018
MP5.5	Final geotechnical characterization report		Jan. 2019
MP5.6	Site ready for operation phase, including conditions for use		June 2019
6	**Soft Clay Site**		
MP6.1	Screening tests completed – Site selection	5	June. 2016
MP6.2	Contract signed with landowner		June. 2016
MP6.3	Site preparation completed (utilities + permanent installation)		Sept. 2017
MP6.4	Site characterisation – completed		Nov. 2018
MP6.5	Final geotechnical characterization report		Jan. 2019
MP6.6	Site ready for operation phase, including conditions for use		June 2019
7	**Quick Clay Site**		
MP7.1	Screening tests completed – Site selection	5	Nov. 2016
MP7.2	Contract signed with landowner		Dec. 2016
MP7.3	Site preparation completed (utilities + permanent installation)		Sept. 2017
MP7.4	Site characterisation – completed		Nov. 2018
MP7.5	Final geotechnical characterization report		Jan. 2019
MP7.6	Site ready for operation phase, including conditions for use		June 2019
8	**Database and workshops/conferences**		
MP8.1	Launching project web site	5.3	Nov. 2016
MP8.2	Data linked to other databases in Norway		June 2019
MP8.3	Database for project use		Jan. 2017
MP8.4	Launching of database for general use		June 2019
MP8.5	International workshops		16'; '17; '18
MP8.6	International conference		June 2019
9	**Administration**		
MP9.1	Steering Committee meetings	4	Twice a year
MP9.2	Reporting RCN		Continuously
MP9.3	Follow-up of project[b]		Continuously
MP9.4	Technical reportingb		Continuously
	Sum	**47.3**	

a: Costs shown exclude in kind contributions;
b: Part of the costs for these items is included in MPs 3 to 7.

3 Health, safety and environment (HSE)

The consortium shall give priority to safety in all its activities. Safety includes protection of life and health, work environment and property, as well as protection of the external environment from pollution and other damages. The aims of the safety program are:

- To prevent accidents, damages and unsafe work conditions.
- To prevent conditions that could lead to products involving unacceptable or hidden risks.
- To avoid negative effects on life, health, property or environment, in the short and long term.

A document with "General site procedures and HSE" is presented in **Appendix A**. The safety philosophy of the consortium is based on the principle that anyone who manages others is responsible for the safety in their work. This does not relieve each individual of the responsibility for his/her own safety and for ensuring that the work carried out does not lead to risk or damage to others, the environment, property or equipment.

The consortium encourages each employee and each partner to report conditions and situations believed to be unsafe. Frankness in matters of safety is the basic philosophy. A reporting card example is given in **Appendix A**, and an electronic version is available on the project intranet.

Relevant HSE procedures and instructions at NGI for the project work are:

- HMS34.0106 Personal protective equipment
- HMS34.0107 Near-misses, incidents and accidents
- HMS34.0111 Emergency response plan to be used in crisis situations
- HMS34.71 Onshore fieldwork
- HMS34.7104 Daily contact and reporting

These are reproduced on the NGTS intranet web side. Should an accident occur, reports will be made through the Partner's reporting routines, and on the form as given in **Appendix A**.

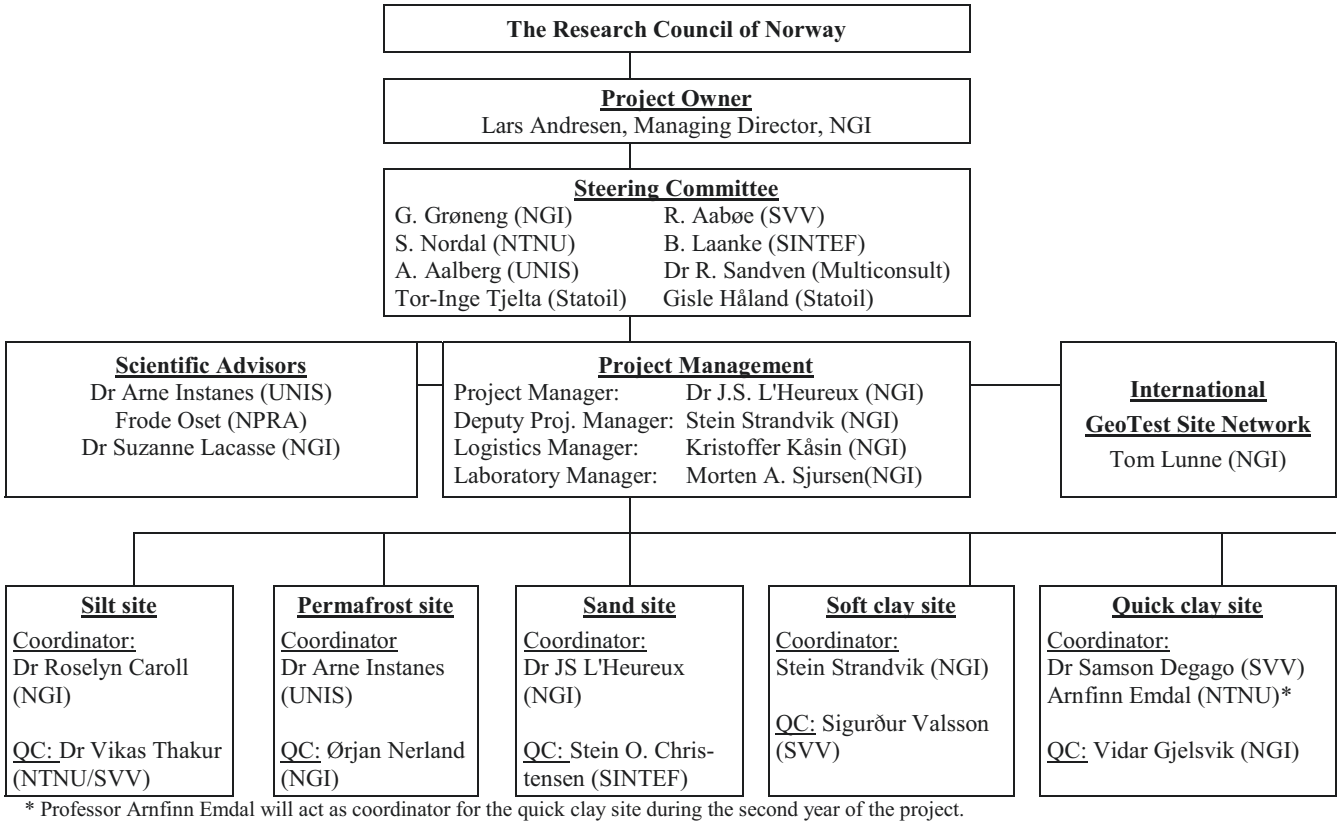
4 Organisation

4.1 Project organisation

The organisation plan for the NGTS project is shown in Figure 1. Dr Jean-Sébastien L'Heureux, Discipline Lead at NGI, will be the Project Manager (**PM**). Mr Stein Strandvik will be deputy project manager (**DPM**). Since the project has much fieldwork and day-to-day aspects to be dealt with, Mr Kristoffer Kåsin will act as Logistics Manager (**Log. M**). To insure a close synergy and to coordinate the different laboratories in this project, Mr. Morten A. Sjursen will act as Laboratory Manager (**Lab. M**).

The project is divided into five parts, one for each site. Each site will have a Site Coordinator (**SC**) and a person assigned responsible for to quality control (**QC**).

The project management team will report to a Steering Committee composed of one representative from each consortium partner and two representatives from the industry in Norway. The project management will be advised by a Scientific Advisory Board composed of internationally recognised researchers on site characterization and soil behaviour, Prof. Arne Instanes of UNIS, senior geotechnical advisor Frode Oset of NPRA and Dr Suzanne Lacasse, Technical Director at NGI. The International GeoSite Network will also act as external advisers and contributors to the project. Project management will be at NGI in Oslo, with nodes in Trondheim with NGI/NTNU/SINTEF/NPRA and in Longyearbyen, Svalbard with SINTEF/ UNIS. The partners will issue a short report at the end of each year on the use and status of the national test sites. NGI will report to RCN through its annual reporting and at any other time, as required.



* Professor Arnfinn Emdal will act as coordinator for the quick clay site during the second year of the project.

Figure 1. Organization plan for Norwegian GeoTest Sites project.

4.2 Responsibilities and duties

4.2.1 Steering Committee

A suggestion for the role of the Steering Committee was presented and approved at the first Steering Committee meeting on 22.06.2016. The role of the SC is defined in **Appendix B**. Under ordinary circumstances, the Steering Committee meets 3 times a year, in 2016, there will be two Steering Committee meetings.

4.2.2 Scientific Advisory Board (SAB)

A proposition for the role of the Scientific Advisory Board was presented and approved at the first Steering Committee meeting on 22.06.2016. The role and mandates of the SAB are described in **Appendix C**.

4.2.3 Project Manager (PM)

The **PM** shall ensure that the work is performed according to the scope of work (ref. Chap. 2) and according to the revised project proposal and contract between RCN and NGI. The **PM** is responsible for ensuring that the administrative routines in the project are followed, i.e. document flow, filing and monitoring of the project according to cost and progress plans. **PM** is NGI's contact for communications with RCN. **PM** will organize the quality control of all outgoing documents according to NGI's internal routines.

PM is responsible for calling meetings to enhance and improve coordination, uniformisation and effectiveness of the work at the sites, when such meetings would be relevant for all site coordinators.

The Steering Committee approved a power of attorney to the **PM.** The Chair and Project Manager are to consult each other when such allocations are to be decided.

- The Project Manager can make allocations of up to 100.000 NOK per project, with a maximum accumulated 500.000 NOK per year, in addition to the approved budgets by the Steering committee (except for the last year where the maximum total budget is not to be exceeded).
- For equipment or facility investments, the Project Manager can make allocations of up to 50.000 NOK per investment and an accumulated 200.000 NOK per year.

The total allocations in between SC meetings by the Project Manager, including project work and equipment/investments, shall not exceed NOK 700.000 NOK per year. Such allocations shall be reported and included in the project financial reports at the first Steering Committee meeting following the allocations.

4.2.4 Site Coordinator

Each site in NGTS have been appointed with at **Site Coordinator**. The Site Coordinator is also the person technically responsible for the site. The mandate and responsibilities of the Site Coordinator are:

- Provide work plans, including yearly budget, for the site to the PM. The site coordinatory is responsible for involving QC in the preparation of the plans. The site coordinator and PM are to agree before plans are presented for approval by the Steering Committee.
- Provide to PM progress reports and revised budget based on progress for site according to schedule decided by the Steering Committee.
- Participate in Steering Committee meetings whenever needed.
- Report annually invoiced hours and in kind contributions by all partners for the site.
- Act as main technical responsible and ensure that adequate quality control of all activities and field and laboratory test results at the site has been carried out.
- Ensure that the QC person is involved in the work (see next section).
- Be the overall responsible for implementing HSE regulations at the site, including reporting close calls, mishaps and accidents to the Project Manager.
- Prepare an information sheet for residents and neighbouring parties on research project, what will happen, possible inconvenience (noise, vibrations, traffic etc). Prepare a sign to inform public that site is an RCN infrastructure investment for geotechnical testing. Request permission to post the sign in a visible location.
- Coordinate all activities on the site, also activities at the site outside scope of work for the NGTS project, but associated with the infrastructure. Keep the PM informed of all activities at the site.
- Call to regular meetings for his site to ensure timely progress, uniformity of procedures used and quality of the work.
- Coordinate field activities with other Site Coordinators, in cooperation with PM, especially for installation of permanent installations at the site and testing of new equipment.
- Ensure that the laboratory and in situ field testing are performed according to the standardized procedures agreed upon in the Standardization Group (reference to come) of the NGTS project.
- Ensure that the test results are reported to the Project Database in the format developed for the database (reference to come).
- Issue Standard agreement document between the Partners and the Project for the tasks to be performed. Any sub-contracts for work execution shall be covered by a separate agreement. Copy of all agreed sub-contracts are to be forwarded to PM. All

subcontracts will be between NGI (PM or a person delegated by him) and the organization performing the work.

- Be responsible for invoicing the work done at the site to the Project (via PM).

4.2.5 Quality Control (QC)

A **QC** person has been associated with each site in NGTS. The mandate and responsibilities of the QC are:

- Provide input to the work plans, budget and execution of the site, mainly from the scientific point of view
- Meet regularly with the Site Coordinator for updates on the work
- Provide input on results and infrastructure, and ensure that the work done and the results obtained are of adequate (high) quality.
- Contribute to fulfilling the commitments made to RCN, within approved budgets.
- Contribute to ensuring that the priorities made for the site are optimum for the project

5 Planning work and methods

5.1 Responsibilities

PM is responsible for the necessary updating of instructions and procedures and that the work is performed according to contract specifications.

Each Site Coordinator is responsible for planning the work on his/her respective site, and to include the **QC** and the **PM** in all discussions. The Site Coodinators are to insure that the established and agreed methods are used in the work.

Log. M and **Lab. M** are responsible for the establishment of unified in situ and laboratory procedures between the partners. Partners are to suggest updates as work progresses.

5.2 Document system and file structure

Handling and filing of documents will be according to the quality assurance system at NGI. NGI's quality assurance system is described in **Appendix D**.

Organization of field data, folder structure and coordinate list should follow guidelines given in **Appendix G.**

5.3 Schedule and sub project numbers

The overall milestones (MP) schedule for NGTS were shown in Table 1. Sub project number and allocated budget for 2017 are presented in **Appendix E**.

5.4 Communication

The working language in NGTS is Norwegian and English. Deliverables, reports and publications are to be prepared in English, except popular articles for Norwegian press.

NGI has drafted a communication plan for NGTS presented in **Appendix J**. This plan will insure recognition confidence of all partners in external and internal communication.

5.5 Meetings

5.5.1 Project and sub-project Meetings

Project meetings shall be arranged upon the partners request. **PM** or one selected by him/her is responsible for sending out Call for Meeting and Agenda, and to produce Minutes of Meetings and sent to the participants. Internal meetings within the project groups will be conducted for mutual information and updating on project progress.

Based on experience with the large GeoFuture and BegrensSade projects for RCN, technical meeting within the sub-projects (i.e. each site) every quarter have worked well. Without these meetings, coordination and technical progress were deficient.

5.5.2 Steering Committee Meetings

Under ordinary circumstances, the Steering Committee will meet three times a year.

The Project Manager has the responsibility to call in the Steering Committee meetings, prepare the agenda and the required documents for Steering Committee decisions. The project Manager has also the responsibility of preparing the minutes of the meetings.

If the Chair cannot be present for a Steering Committee meeting, the Chair is to designate a Vice-Chair to preside the Steering Committee meeting.

The Chair of the Steering Committee and the Project Manager and each of the partners that have signed the Consortium Agreement have the right to call in an extraordinary Steering Committee meeting.

Each of the partners can invite a technical person from his/her organization to attend a Steering Committee meeting, in the case of detailed technical discussion on a topic.

5.6 Cost and progress reporting

Templates for cost and progress reports are presented in **Appendix F**. These are also available on the project intranet site. The site coordinators are to send their reports to the **PM** following the schedule presented in Table 2 and Table 3 below.

Table 2: Schedule for cost and progress reporting for 2016.

Year	**2016**											
Month	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Annual work plan approved	X											
Progress report w/status of deliverables and products										15 Oct., pr 30/9		
Overview of invoiced hours (Excel sheet)										15 Oct., pr 30/9		
Overview of inkind contribution (Excel sheet)										15 Oct., pr 30/9		
Invoice to NGI (including above three reports)										15 Oct., pr 30/9		

Table 3: Schedule for cost and progress reporting for 2017.

Year	**2017**											
Month	1	2	3	4	5	6	7	8	9	10	11	12
Annual work plan approved	X											
Progress report w/status of deliverables and products	15 Jan,. pr 31/12				15 May, pr 30/04				15 Sept., pr 31/08			
Overview of invoiced hours (Excel sheet)	15 Jan, pr 31/12				15 May, pr 30/04				15 Sept., pr 31/08			
Overview of inkind contribution (Excel sheet)	15 Jan, pr 31/12				15 May, pr 30/04				15 Sept., pr 31/08			
Invoice to NGI (including above three reports)	15 Jan., pr 31/12				15 May, pr 30/04				15 Sept., pr 31/08			

Table 4: Schedule for cost and progress reporting for 2018.

Year	**2018**											
Month	1	2	3	4	5	6	7	8	9	10	11	12
Annual work plan approved	X											
Progress report w/status of deliverables and products	15 Jan,. pr 31/12				15 May, pr 30/04				15 Sept., pr 31/08			
Overview of invoiced hours (Excel sheet)	15 Jan, pr 31/12				15 May, pr 30/04				15 Sept., pr 31/08			
Overview of inkind contribution (Excel sheet)	15 Jan, pr 31/12				15 May, pr 30/04				15 Sept., pr 31/08			
Invoice to NGI (including above three reports)	15 Jan., pr 31/12				15 May, pr 30/04				15 Sept., pr 31/08			
Update of coordinate master file	15 Jan				15 May				15 Sept.		15 Nov.	

5.7 Intranet and file transfer

To facilitate the exchange of administrative documents, templates and other important information related to the NGTS Project, a Dropbox folder has been shared with all project participants. For Site Coordinators, all documents needed for invoicing, documentation of in-kind, progress report and subcontract templates can be found in the "Administrative templates" folder. Below is a quick link that can also be used to access the shared folder.
https://www.drobox.com/sh/vj5lb6cyvdpekj1/AABfe1SPA4wJOYRFNQNLHTeua?dl=0

5.8 Website

As per 15-09-2016, the following domains have been bought: www.ngts.nu + www.geotestsite.no. These domains link to a NGI webpage with general information about the project.

The DataMap application will be used to address the major challenge of capturing, classifying, organizing and making available geotechnical research data from the NGTS test sites. The DataMap portal will in the near future be accessible from the NGTS webpage and from the LinkedIn site. An overview of the DataMap application is given in **Appendix H.**

6 Non conformance

Deviations shall be recorded in a non-conformance file kept by **PM**.

PM is responsible for implementing any relevant corrective action as results of nonconformance reports.

7 Consortium agreement

Each partner has signed a consortium agreement. Agreement contains a number of prescriptions, such as open results of the work in Norway, ownership of project results, use of the sites, investment rules in Norway and EU (e.g. Public Procurement Act). A copy of the signed consortium agreement is to be saved on the project's intranet website.

8 Project risks

A qualitative project risk analysis was done to identify potential risks involved in the project; see Table 5. The analysis resulted in a moderate risk classification. The analysis has been performed in accordance with Work Instruction A1-001 Risk assessment in NGI's bids and projects.

Critical factors that may impair the success of the project are: (a) not finding 5 good sites in Norway that fulfil the requirements for long-term testing and the requirements for providing benchmark data; (b) "losing" one or several of the sites due to unforeseen urbanization or commercial interest conflicts: at the start of the project, the long-term use agreements to ensure 20 years of use of the five selected test sites will be finalized; (c) reduced of use of the test sites by users from Norway and abroad; (d) on Svalbard, accessibility to equipment such as drill rigs, *in situ* devices and support construction; rough weather and low temperatures; (e) loss of personnel. The consortium partners are confident that these challenges can be solved.

The risk analysis in Table 5 presents the hazard, impact and mitigations measures for all element at risk. The risk analysis and action plan will be reviewed and submitted to the Steering Committee together with the annual work plan at the January SC meeting each January.

Table 5: Potential risks for NTGS project for establishment phase 2016-2019

No.	Risk element	(L, I) Risk category	Hazard/Impact/Mitigation measures
1.	Not finding 5 good sites	(1,3) Medium risk	*Hazard:* Not finding site (low probability of this happening). *Impact*: Not reaching consortium or RCN goal Loss of reputation Delay *Mitigation measures:* Locate sites not already located at the earliest; if site not found, decide on an alternative rapidly (before 2017-02-01)

2.	Within the project period, sites becomes unavailable due to unforeseen event/decision	(1, 1) Low risk	*Hazard:* Public policy change or owner changes his mind (low probability). *Impact:* Need to find another site with similar conditions, or restart at a new site. *Mitigation measures:* (1) Signed agreement with site owner ASAP; (2) Careful availability check at time of site selection; if any signs of potential problems later on, immediately find an alternative site with comparable properties
3.	Testing space too small	(2, 2) Medium risk	*Hazard:* Too many users at same site, or space too small (medium probability). *Impact:* Sites availability will not last 20 years Mitigation measures: Initially select site with 150m x 150m. If the site is less than 90m x 90m, select a site in neighbourhood with probably similar soil and check on its availability.
4.	Physical accessibility of drill rigs, in situ devices, infrastructure	(1, 3) Medium risk	Hazard: This situation is quite unrealistic, it will always be possible to do some kind of testing. (low probability, given the measures above for selecting the sites). Some problems may occur because of public complaints to noise, traffic, dust, mud. etc Impact: Need to change site. This should have been discovered at an early stage of the work Mitigation measures: Similar to risk 2 and 3. (1) Signed agreement with site owner that take into account possible objections of undiscovered bedrock, for example (2) Careful availability check at time of site selection; if any signs of potential problems later on, immediately find an alternative site with comparable properties; (3) Inform residents and neighbouring parties of research project, what will happen, possible inconvenience. Make this obligatory at all sites.
5.	Weather conditions Svalbard	(2, 1) Medium risk	*Hazard:* Weather is unpredictable *Impact:* Mainly delays, which may lead to change in personnel *Mitigation measures:* Have a flexible testing program; no other measures really, accept that delays may happen for the permafrost site.
6	Loss of key personnel, competence gap because of lack of personnel or key personnel change employer	(3, 3) High risk	*Hazard:* Very high probability that this will happen, that has already happened in project. Project has some vulnerable partners with few personnel. *Impact:* Not enough competence at time when it is needed. Vulnerable partners not sure if they can replace personnel: Resulting delays; lower quality; higher costs than planned because of overlap and need for learning. Svalbard site is especially vulnerable because few experts in Norway. *Mitigation measures:* NGI is a very big organization with many with expertise in area of project (except permafrost where NGI has only a few) - NGI can bridge the gap for a period; Project partners to take contact already with expertise from abroad who could help on a post-doc or guest researcher basis; partners that lose key personnel are to inform PM at the earliest so that replacements within partner staff, from other partners or from other companies can be provided for a while to prevent delays and quality gap.
7	Not enough use by partners or other users	(1, 1) Low risk	*Hazard:* At this time, seen as low probability. *Impact:* Delays, loss of reputation, economy in the operation phase. *Mitigation measures:* Dissemination plan already form the start, both in Norway and abroad. That has already started.

Notation
L = Likelihood, I = Impact
Risk class: 1 = low; 2 = medium; 3 = high

Appendix A

General site procedures and HSE

General site procedures and HSE

Anyone who manages others is responsible for safety in their work. The Site Coordinator is the main responsible for all activities performed on the specific site. One appointed person, present at the site (Field Responsible), should at all time be the main responsible for the ongoing field activities, also related to HSE. This appointed person should perform daily reporting to the Site Coordinator. This does not relieve each person of the responsibility for his own safety and for ensuring that the work carried out does not lead to risk or damage to others, the environment, property or equipment.

If needed, notification of the landowner, the municipality, the district governor at Svalbard (Sysselmann) or others, should be forwarded by the Site Coordinator before field activities take place.

Before departure for field work, daily reporting between the Site Coordinator and the Field Responsible should be clarified and agreed upon. It must be established that mobile services are available. Otherwise, sat phones should be mobilized. There should be contact between the Field Responsible and the Site Coordinator at least once a day.

All personnel present at the site, should bring her/his own authorized personal protective equipment PPE. Each individual should be familiar with the use the PPE. Each Partner is responsible for giving proper training in the use of the PPE. The following PPE, however not limited to, should be used at all time at the field:

- Safety helmet
- Safety glasses
- Hearing protection
- Coverall
- Gloves
- Safetyboots

The Field Responsible should make sure that suitable first aid kits are available at Site.

Has a mishap or accident taken place, one should immediately

- Limit spreading and harmful effects, without exposing oneself to danger
- Secure the incident site
- Giver first aid
- Call emergency services directly

After a close call, mishap or accident, the Field Responsible should report through the Partner's reporting routines and on the form given in Appendix A. The form given in Appendix A should be forwarded to the Site Coordinator who will report this to the Project Manager and to the appropriate authorities at NGI.

By completion of field work, traces of the field work should be removed as much as possible. Report back to the Site Coordinator when you are leaving the Site.

Internal report on close calls, mishaps and accidents

NGI

1. The person(s) injured or involved in the close call, mishap or accident	
Name(s):	Position:

2. Time/date/location		
Date:	Time:	Location:

3. Project/Project number	Activity at time of incident

4. Number of work hours at incident site

5. Witnesses	Others involved

6. Incident account (When necessary use appendices)

7. Immediate countermeasure(s) (When necessary use appendices)

8. Notified		
☐ Head of Section	☐ Head QHES	☐ Police
☐ Project Manager	☐ Labour Inspection	☐ Doctor
☐ Safety Delegate	☐ Client	☐ Fire-brigade

9. Consequences				
☐ Personal injury	☐ Environmental damage	☐ Material damage	☐ Delays	☐ Unknown

10. If personal injury describe injury/how affected

11. Initial/contributing cause(s) (When necessary use appendices)

12. Personnel protection equipment and safety systems		
☐ Required	☐ Available	☐ Used

13. Is a non-conformance report completed and submitted?	
☐ Yes	☐ No

14. Comments, additional information and sketches (When necessary use appendices)

15. Preventive measures (When necessary use appendices)

16. Author/date

The report to be kept by the Head of QHES. Copies are sent to the persons involved at NGI, the Project Manager, relevant Division Directors and the Head of Personnel. In addition the Head of QHES sends a copy to the client when the report relates to a specific project.

Distribution and signatures

Sign:				
Date:				
	Head of Section	Safety Delegate	Head of QHES	Managing Director

Appendix B

Role of the Steering Committee

Appendix B Role of the Steering Committee for NGTS

B1 Steering Committee

The NGTS project has its own Steering Committee. The Steering Committee (SC) elects its own Chair for the duration of the project. The Steering Committee's contact person is the Project Manager of NGTS.

The Steering Committee is to act in accordance with the clauses in the Consortium Agreement signed by all consortium participants.

B2 Representation on the Steering Committee

Each of the consortium participants (also called partners), NGI, NTNU, UNIS, SINTEF and SVV-Vegdirektorat, have the right to have one representative on the Steering Committee. The Research Council of Norway can have one observer who attends the Steering Committee meetings.

B3 Responsibilities of Steering Committee

The Steering Committee has the responsibility of approving:

- Annual work plan, including schedule, at each test site and other activities related to the establishment of the sites (2016- 2019)
- Associated annual budgets
- Annual accounts and reports to The Research Council of Norway
- All decisions related to the transition from the establishment phase to the operational phase (in 2019) (see also consortium agreement signed by all partners).

The members of the Steering Committee have also the responsibility of warning the Steering Committee and the Project Manager of any significant factor that can result in the project not reaching its objectives.

The Steering Committee function is for the duration of the establishment phase (The Research Council of Norway project). It may choose to continue, or not continue, its role during the operational phase.

The Steering Committee can decide to accept or refuse the participation of new partners in the project and whether or not such new partner(s) will have representation on the Steering Committee and voting rights.

B4 Annual work plans and budgets

The Steering Committee has the responsibility of setting priorities for the annual work plans, schedules and budgets. The documents providing the background for the Steering Committee decision will have been prepared by the Project Manager prior to the Steering Committee meeting where the decisions are to be made.

Role of the Steering Committee

The Steering Committee shall approve the overall budget for equipment/facilities investments and all individual investments above NOK 50,000.-. The Steering Committee shall approve the overall budgets for the different work tasks at each site and all project tasks costing more than NOK 100,000.-. The Steering Committee shall approve an annual administration budget, which is then under the responsibility of the Project Manager.

In cases that cannot wait for the next Steering Committee meeting, the Project Manager can ask for approval of changes in budgets and changes in approved work tasks by e-mail or tele-conference.

B5 Other tasks of Steering Committee

The members of the Steering Committee shall also contribute to:

- The infrastructure project meeting the objectives of The Research Council of Norway.
- The project fulfilling the commitments made to The Research Council of Norway, within the approved budgets.
- Ensuring a good collaboration among the partners.
- Ensuring that the priorities made are optimum for the project.
- Reassigning tasks and budgets if one part of the project is late in execution.

The Steering Committee shall also act as an adviser to the Project Manager on all matters pertaining to the project.

B6 Steering Committee decisions

The requirements for valid decisions by the Steering Committee are detailed in Clause 3.4.7 in the Consortium Agreement signed by all partners.

Each of the partners have the right to one vote. In the case of a tie, the Chair of the Steering Committee has double vote.

Fifty percent participation (physically or electronically remote) is required to make a Steering Committee decision (required quorum). For decisions not affecting a partner's rights described in the consortium agreement, decisions are made with a minimum of 51 % of the votes.

B7 Steering Committee meetings

Under ordinary circumstances, the Steering Committee will meet three times a year.

The Project Manager has the responsibility to call in the Steering Committee meetings, prepare the agenda and the required documents for Steering Committee decisions. The project Manager has also the responsibility of preparing the minutes of the meetings.

If the Chair cannot be present for a Steering Committee meeting, the Chair is to designate a Vice-Chair to preside the Steering Committee meeting.

Role of the Steering Committee

The Chair of the Steering Committee and the Project Manager and each of the partners that have signed the Consortium Agreement have the right to call in an extraordinary Steering Committee meeting.

Each of the partners can invite a technical person from his/her organization to attend a Steering Committee meeting, in the case of detailed technical discussion on a topic.

Appendix C

Mandate of the Scientific Advisory Board

Appendix C Mandate of the Scientific Advisory Board

C1 Composition

The Scientific Advisory Board consists of the following members:

Mr Frode Oset, Statens Vegvesen – Vegdirektoratet,
Dr Suzanne Lacasse, NGI
Dr. Arne Instanes, UNIS

C2 Mandate of Advisory Board

The Scientific Advisory Board is to provide input to the work plans, the execution and the results of the project. The members of the Scientific Advisory Board are expected to provide their opinion on the results obtained, and how these may affect practice and how the project can be improved, mainly from the scientific point of view. Input on the database and the future use of the sites is however also welcome.

The Scientific Advisory Board is to meet with the members of the Steering Committee, but is also invited to counsel the responsible persons for the technical work directly through meetings (see below).

Information and an agenda will be sent to the Scientific Advisory Board prior to each meeting. Technical information will be presented during the meetings, and room will be left for discussion. The Scientific Advisory Board is not to act as a Third Party reviewer of documents produced by the project.

In between meetings, the Scientific Advisory Board will be kept informed of the progress through the minutes of the Steering Committee meetings and progress reports from each subproject, and will be invited to attend all national and international events organized by the project.

C3 Meetings with Steering Committee and project team

The Scientific Advisory Board will be invited to meet with the Steering Committee and the project team once a year (in 2017, 2018, 2019), preferably at the May/June meeting. The first meeting will take place in 2017.

The meetings will usually last one day and will be held in Oslo, Trondheim or in Longyearbyen. Other venues are possible. At this time, the set-up for the meetings is suggested to consist of:

Morning

- Meeting with selected project managers for discussion of more detailed scientific/implementation topics than done in the Steering Committee meeting.
- Discussion time for Scientific Advisory Board on their conclusions and recommendations.

Afternoon

- Attendance to the Steering Committee meeting, where an evaluation/comments/suggestions for improvement/adjustments to research directions can be made by the Scientific Advisory Board to the Steering Committee.

Mandate of the Scientific Advisory Board

All expenses incurred for the participation in the Scientific Advisory Board will be compensated for by the project (through the Project Manager, Jean Sébastien L'Heureux).

Appendix D

NGI's quality assurance system

VÅR REF
GAS/rcr

DATO
2015-01-01

DERES REF

Short description of NGI's quality assurance system

"System for Internal Control. General Part", NGI Report 30-02 summarises NGI's Health, Environment and Safety system and quality assurance system and applies to all work at NGI. It will be forwarded on request.

NGI have had an active quality assurance system for more than 30 years. NGI's system is in accordance with legal and other relevant requirements and meets the requirements of NS-EN ISO 9001.

Co-ordination and follow up of current quality assurance activities is assigned to the *Head of QHES* who reports directly to the *Managing Director*. Quality assurance activities within projects are the responsibility of the Project Manager. Moreover, current quality assurance activities in NGI's divisions are clearly defined as the responsibility of the Head of the respective division.

Through planned internal quality audits, NGI continually verifies that the organisation is working in accordance with contract requirements as well as quality requirements. Implementation of any corrective actions is carried out and followed up by the Project Manager or respective Division Head as relevant.

NGI is registered to ISO 9001:2008 by the British Standards Institution (BSI) for research and development and consulting within the geosciences.

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CERTIFIED BY BSI
FS 32989/EMS 612006

Allocated budget for 2017 for all sites and activities

Appendix E

Allocated budget for 2017 for all sites and activities

Subproject	*This period* Budget for 2017 (NOK)
MP1 - Preliminaries	
MP2 - Acquisition of equipment	4,600,000
MP - 3 Silt	1,482,000
MP - 4 Sand	1,650,000
MP - 5 Permafrost	3,500,000
MP - 6 Soft Clay	2,149,000
MP - 7 Quick Clay	1,879,000
MP - 8 Database /workshop/Understanding of soil behaviour (all soil types)	800,000
MP - 9 Administration	1,000,000
No inkind included	17,060,000

Appendix F

Template for reporting for each subproject

NGTS

Template for reporting for each subproject

Appendix F

F1 Background

Subprojects are requested to prepare progress reports thrice a year, for periods ending 30 April, 31 August and 31 December. Reports are due received by Project Manager within the 10th day of the following month (i.e. 10 May, 10 September and 10 January). This is necessary to ensure a good (i.e. no unused funds at the end of the year) and reliable reporting to the research Council of Norway. Suggested maximum length for the progress report: 2 pages.

F2 Template

The template is on next page. It is completed with an EXCEL template that produces the graphs.

NGTS

Template for reporting for each subproject

Progress report RCN infrastructure project

NGTS

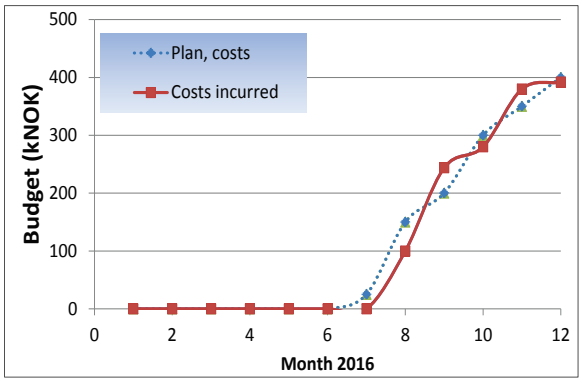
Progress report for period _____

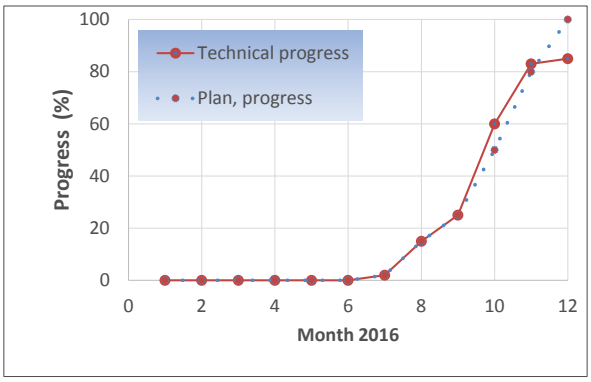
Reports are to be prepared thrice a year, for periods ending 30 April, 31 August and 31 December. Reports are due received by Project Manager within the 10th day of the following month (i.e. 10 May, 10 September and 10 January. Suggested maximum length: 2 pages.

Project/Site	
Responsible partner	
Reported by	
Year/budget	
Date	

Progress in terms of costs and execution

Examples will be removed from template, copy and paste from EXCEL template or similar





Results during period

Introduction *(if necessary)*

What has been done, what is completed? *(can be an enumeration)*

NGTS

Template for reporting for each subproject

Are there delays or unforeseen results or problems? Any requests for assistance?

Plans for next period

Products to be included in RCN list

(new methods, new interpretation, new codes, publications, lectures, courses, etc

Appendix G

DATA MANAGEMENT

Contents

G1 Structure to filling electronic documents

Organisation of field data will be as per Table 1. This will include raw and interpreted data. At present it is planned to store interpreted data separate (in the associated Interpretation folder) to raw data. This will start the physical process of getting raw data files in order (Stage 1) for quality control (Stage 2) prior to upload (Stage 3) to the selected online data management tool.

An example list of these folders is located on P
P:\2016\01\20160154\Fieldwork\00-Upload-Examples
Some folders contain example raw data files.

The list of folders below is a working list and it is anticipated that more folders will be added in the future. Further details on specific file format and file naming will follow.
A core feature of the NGTS project raw files is that each raw data file must start with the three letters to identify the site location followed by the and hole ID presented in this report. The terms listed in Table 1 are updated in the master coordinate files and a log of updates is presented in the excel master coordinate file.

G1.1 In situ test filling structure prior to upload

Table 1 Folder structure for field data

Folder Name	ABBR/Group Name	Abbreviation definition Sampler & In situ test	Term in LOCA_ID-HOLE_ID
-	NA	Attempted test - no results reported	-
-	DMT	Dilatometer test	D
00-Upload-Halden			
01-NewSiteOptions		Information related to screening for new sites options	
02-Planning		Information related to plans for field testing	
BH		Borehole logs	
BH	BG	Bag sample (unrelated to a BH)	BG
BH	BH54	54 mm sample borehole (no liner)	B
BH	BH54C	54 mm composite sample borehole (with liner)	B
BH	BH72	72 mm sample borehole (no liner)	B
BH	BH75	75 mm sample borehole (no liner)	B
BH	BHGPS	Gel push Static penetration	B
BH	BHGPTr	Gel push Triple tube sampler	B
BH	BHSB	Sherbrooke block sample borehole (large)	B
BH	BHSBm	Mini Sherbrooke block sample borehole	B
CPT-R-S-DIS		CPTU, SCPTU, RCPTU, Dissipation test	

CPT-R-S-DIS	CPT	Cone penetration test **without** pore pressure measurements	C
CPT-R-S-DIS	CPTU	Cone penetration test with pore pressure measurements	C
CPT-R-S-DIS	CPTU-DIS	Cone penetration test with dissipation	C
CPT-R-S-DIS	RCPTU	Resistivity cone penetration test	C
CPT-R-S-DIS	RCPTU-DIS	Resistivity cone penetration test with dissipation	C
CPT-R-S-DIS	SCPTU	Seismic cone penetration tests	C
CPT-R-S-DIS	SCPTU-DIS	Seismic cone penetration tests with dissipation	C
DBERT	DBERT	Downhole ERT	DE
DBGPR	DBGPR	Downhole GPR	DG
DBseism	DBseism	Downhole seismic	DS
EM	EM	Electromagnetic	E
EPCT	EPCT	Earth pressure cell test (hydraulic, Glötzl)	EP
ERT	ERT	Electrical resistivity tomography	ER
FVT	FVT	Field vane	V
GPR	GPR	Ground penetrating radar	R
HFST	HFST	Hydraulic fracture stress test	H
INC	INC	Inclinometer	I
Interp-CPT-R-S-DIS		Interpretation- CPT-R-S-DIS	
Interp-ERT		Interpretation-ERT	
Interp-GPR		Interpretation-GPR	
Interp-MASW		Interpretation-MASW	
Interp-SDMT		Interpretation-SDMT	
MASW	MASW	Multichannel analysis of surface waves	M
PAC	PAC	Pack test	PA
Photos		Photos	
Piezo	Piezo	Piezometer	PI
RCD	RCD	Rock control drilling	RC
RPS	RPS	Rotary pressure sounding	RP
RWS	RWS	Rotary weight sounding	RW
SBP	SBP	Self boring pressuremeter test	P
SDMT	SDMT	Seismic dilatometer test	D
SLU	SLU	Slug test	SL
SP	SP	Self polarisation	SP
SRefra	SRefra	Seismic refraction	SRR
SRefle	SRefle	Seismic reflection	SRL
SS	SS	Simple Sounding	SS
StandP	StandP	Stand pipe	S
THS	THS	Thermistor string	TH
TS	TS	Total sounding	TS

VSP	VSP	vertical seismic profiling	G
XBERT	XBERT	Crosshole ERT	XE
XBGPR	XBGPR	Crosshole GPR	XG
XBseism	XBseism	Crosshole seismic	XS

*Additional interpretation folders to be added.

Note: Health and safety documents are to be saved in a separate folder on the project called HMS. Each site will have a sub folder and within that HMS files should be saved. Information on underground services will be saved with Kart at present.

G1.2 Coordinate file

A standard format for recording in situ tests has been prepared for the NGTS project. This will be a live document and revisions to account for improvements and updates should be expected during the life time of the project. There will be one master coordinate file per site and it will take priority over .kof files. Coordinates collected using Differential Global Positioning System (DGPS) or Stand-Alone GPS must be entered in this sheet and the associated information populated promptly. Not it is required to export an extended file from the GPS devise to include information about the quality and accuracy of the recordings. The .kof files will be saved in the project for back up reference however the working coordinate file for the project will be the master coordinate file.

Each master coordinate file has five tabs. An example of this for Halden is:

1. Settings
2. ABBR (abbreviations)
3. HAL
4. HAL-Com (comments)
5. HAL-layers

Settings contains information that is used several times in different tabs for each site. The information on this tab is selected through drop down menus in the tabs 3-5.

In the Settings and ABBR tabs:

- Do not sort
- Do not move contents
- Do not edit existing entries
- New entries to be added in blank cells

If you identify an error in the file please email to the Project Manager (JSL) and data management coordinator (RCa) at the same time to inform them of the new information.

jean-sebastien.lheureux@ngi.no; roselyn.carroll@ngi.no

An explanation of terms

HEADING	Name of the sheet
PROJ_ID	Project ID number
PROJ_NAME	Project name
PROJ_LOC	Project location
PROJ_CLNT	Project client
PROJ_CONT	Project contractor
PROJ_END	Project engineer

Information about the coordinate system and location of the measurements are listed in columns I to L of Settings. Some terms are listed here as they are referred to later in site reports using abbreviated terms. This set of terms can be added to and will later be presented in reports as part of the abbreviated term list. It will be one unified list for all sites. The aim of setting out terms associated with coordinates and equipment in this master coordinate file is to ensure continuity in the abbreviated terms used in reporting across the five sites.

If a site has additional settings or information that should be added, this can be done by first sending an email to the Project Manager (JSL) and data management coordinator (RCa) to inform them of the new information. A formal revision of the Settings tab or any other changes will then be implemented centrally by the data management coordinator and a revised master coordinate file will be issued to all site coordinators at an agreed point in time.

The GPS equipment is under development and it is kindly asked that each site sends information about the GPS equipment ID, antenna and logger email to the Project Manager and data management coordinator.

G1.2.1 ABBR

The ABBR tab defines the different samplers and in situ testing techniques that are anticipated at present in the NGTS project. Please forward an email to the Project Manager and data management coordinator if you have recommendations for new tests to be added, errors, suggested improvements or other. This tab has three columns:

1. ABBR/Group Name
2. Abbreviation definition Sampler & In situ test
3. Term in LOCA_ID-HOLE_ID

ABBR/Group Name	Abbreviation definition Sampler & In situ test	Term in LOCA_ID-HOLE_ID

The 'ABBR/Group' name will appear in the coordinate tab, comments tab and layers tab. The list is split into sampling in the top of the table and in situ testing method in the

bottom of the table. The 'Term in LOCA_ID-HOLE_ID' is used to make part of the LOCA_ID-HOLE_ID (location and hole identifier) presented in the last three tabs.

Note that some test ABBR have the same term, for example CPTU and RCPTU are both 'C' and all boreholes are B. The aim of using a term in the name of a location is to keep the ID short and simple for the site. It is noted that use of the ABBR/Group term together with LOCA_ID-HOLE_ID is very informative for reporting and referencing in figures and text. As a result it is recommended to show both entries in all figures and tables. Use of both in text of reports where appropriate is recommended.

The LOCA_ID-HOLE_ID is an important identifier as it forms the START of all files associated with a test where possible and appropriate. When this is not possible at a minimum the folder closed to the raw data must have the LOCA_ID-HOLE_ID at the start of the folder name. However it is desired to keep the latter solution to a minimum.

The 'ABBR/Group' is important for the structure of how data is stored. A set of folders reflecting this layout will be used in the project. Information with examples of files and folder structure will be issued in the coming weeks.

G1.2.2 HAL (or ONS, TIL, OYS, SVA)

OLD ID	LOCA_ID-HOLE_ID	ABBR	UTM	Datum	CM	Northing	Easting
-	-	-	-	-	-	m	m

The OLD ID
Column will be removed later once renaming fully established in reports.

LOCA_ID-HOLE_ID:
XXXterm01
eg
HALB01

First three letters of site
All letters Capital
Use 00 in front of numbers < 100
No spaces in ID name

It is important to note that each term in LOCA_ID-HOLE_ID should start with 01 and increase +1 for subsequent tests.

Use of a letter after the number of the test is permitted, for example if a test stopped at a given depth (10 m) and moves over to a new location and continued (10 m to 20 m) then it may be called HALC01A and HALC01B. There would then be two rows for this test and two unique coordinates should be collected and reported in the master coordinate file. An A and B would also be used to identify the start and end of a ERT line for example. A should be the start and B the end reflective of the direction of the measurements. This can be reported the comments tab also.

ABBR
Select from a drop down menu
UTM
Select from a drop down menu
Datum
Select from a drop down menu
CM
Select from a drop down menu
Northing and Easting
Please take care when entering Northing and Easting as GPS devises can out put these parameters in opposite order.
It is very important that a unique coordinates is collected for each test in the field. Use of one coordinate for several tests may result in future tests being placed at or very close

to previous tests. This is more critical at smaller sites however for continuity across the sites it is required that every test has a coordinate for that particular test.

Elevation surface	GPS Equipment ID	HDOP	VDOP	Field Equipment ID	Cone factor (a)	Depth to end of test	Depth to bedrock	DATE
m	-	m	m	-	-	m	m	YYYY-MM-YY

Elevation surface
Recorded from GPS
GPS Equipment ID
Select from a drop down menu. Please send update on equipment ID and information to RCa and JSL and this information will be added in the next revision. In the meantime please enter your new information on the settings tab and select through the drop down menu.
HDOP
HDOP (horizontal dilution of precision) relates to the horizontal position measurements suggested by GPS data
If no record had been made of this in past coordinate measurements please enter NR (no record). For future measurements it is required to extract a full report from the GPS device for records.
VDOP
VDOP (vertical dilution of precision) relates to the vertical position measurements suggested by GPS data.
If no record had been made of this in past coordinate measurements please enter NR (no record). For future measurements it is required to extract a full report from the GPS device for records.
Field Equipment ID
Enter the ID of the equipment for the test, e.g. the rig used for sampling, or the cone used for CPTU. Enter NA if no equipment ID is required e.g. a stand pipe. Future updates may include more information on the type of equipment used for cases where no ID currently exists.
Cone factor (a)
The cone factor from the CPTU
Note calibration certificates are to be submitted with reports.
In general please ensure you store calibration certs for equipment used in the NGTS project centrally at present.
Depth to end of test
For tests that penetrate into the ground please enter the end depth of the test.
For surface based tests enter 0.00m. If no test was performed at a location for e.g. enter NA.
Depth to bedrock
Enter depth of bedrock from surface if it was encountered during testing.
Enter NA if Bedrock not reached.
DATE

Date of the test. Please used the format YYYY-MM-DD here and throughout reporting and on files if this information is added.

There should be no empty cells in the completed table.

G1.2.3 Comments tab

It is important to have the exact same number of entries in this tab as in the previous HAL tab. This will ensure that there are no missing rows and data will then be easily sorted at a later date. Having all the locations entered in this tab will also provide a rapid overview to the reader of were any comments for a particular location. If there are no comments it will be evident as the comments cell will be empty. This tab is primarily intended for record pertinent information about data or location information. For example if a coordinate was corrected or if a raw data file, such as a CPTU file, was corrected this should be commented here. Or reasons for ending a test at a specific depth.

Copy paste for information from HAL to HAL-Com tab may be easier and reduce errors. Please do not link cells as sorting or moving of data may effect this at a later date.

LOCA_ID-HOLE_ID	ABBR	DATE
-	-	YYYY-MM-YY

G1.2.4 Layers tab

The layers tab will be used to track layering across the site if more than one later exists. This is interpretation that will be carried out after a BH or CPT for example has been interpreted. See columns I to M. Where no unit is present the cell may be coloured grey and if it is waiting for interpretation light yellow should be used to fill the cell. Enter NA where a test or location is not compatible with interpretation with layering such as a piezometer.

It is important to have the exact same number of entries in this tab as in the previous HAL tab. Much of the entries are similar to the HAL tab and so it may be effective to copy paste as discussed previously.

G1.3 File name

Raw data file names examples

The first three letters of a file name, the LOCA_ID-HOLE_ID and the number in the series of the test will be referred to as the **Identifier** in this document, an example of an **Identifier** name is **HALC02.**

File names should be kept short at all times.

Only raw data should be saved in fieldwork folders.

Literature, background information for equipment and Reports from other projects should be saves under:
P:\2016\01\20160154\Literature
P:\2016\01\20160154\Grunnlagsmateriale

Reference reports from other projects

G1.4 File structure

The folder structure is shown in Table 1. This section provides information on each folder type and data associated with it. Table 2 provides file name examples. Norwegian symbols and spaces in folder and file names are not permitted.

Table 2 File name examples

Folder Name	ABBR/Group Name	Term in LOCA_ID-HOLE_ID	File Name Example (1)	File Name Example (2)	Example raw file ready
-	**NA**	**-**			
-	**DMT**	**D**			
00-Upload-Halden	**-**				
01-NewSiteOptions	**-**				
02-Planning	**-**				
BH	**-**				
BH	**BG**	**BG**	HALBG01-Samplelist.xlsx		Yes
BH	**BH54**	**B**	HALB01-Samplelist.xlsx		Yes
BH	**BH54C**	**B**	HALB02-Samplelist.xlsx		Yes
BH	**BH72**	**B**	HALB03-Samplelist.xlsx		Yes
BH	**BH75**	**B**	HALB04-Samplelist.xlsx		Yes
BH	**BHGPS**	**B**	HALB05-Samplelist.xlsx		Yes
BH	**BHGPTr**	**B**	HALB06-Samplelist.xlsx		Yes

BH	**BHSB**	**B**	HALB07-Samplelist.xlsx		Yes
BH	**BHSBm**	**B**	HALB08-Samplelist.xlsx		Yes
CPT-R-S-DIS	-				
CPT-R-S-DIS	**CPT**	**C**	HALC01.xlsx	HALC01.std	Yes
CPT-R-S-DIS	**CPTU**	**C**	HALC02.xlsx	HALC02.std	Yes
CPT-R-S-DIS	**CPTU-DIS**	**C**	HALC03-DIS.xlsx	HALC03-DIS.std	Yes
CPT-R-S-DIS	**RCPTU**	**C**	HALC04-R.xlsx	HALC04-R.std	Yes
CPT-R-S-DIS	**RCPTU-DIS**	**C**	HALC05-R-DIS.xlsx	HALC05-R-DIS.std	Yes
CPT-R-S-DIS	**SCPTU**	**C**	HALC06-S.xlsx	HALC06-S.std	Yes
CPT-R-S-DIS	**SCPTU-DIS**	**C**	HALC07-S-DIS.xlsx	HALC07-S-DIS.stds	Yes
DBERT	**DBERT**	**DE**	HALDE01.dat*		No
DBGPR	**DBGPR**	**DG**	HALDG01.dat		No
DBseism	**DBseism**	**DS**	HALDS01.dat		No
EM	**EM**	**E**	HALE01.dat		No
EPCT	**EPCT**	**EP**	HALEP01.xlsx		No
ERT	**ERT**	**ER**	HALER01.dat		Yes
FVT	**FVT**	**V**	HALV01.xlsx		No
GPR	**GPR**	**G**	HALG01.txt		Yes
HFST	**HFST**	**H**	HALH01		No
INC	**INC**	**I**	HALI01		No
Interp-CPT-R-S-DIS			HALC02-I		No
Interp-ERT			HALER01-I		No
Interp-GPR			HALR01-I		No
Interp-MASW			HALM01-I		No
Interp-SDMT			HALD01-I		No
Interp-Stresses			InSituStresses.xlsx		No
MASW	**MASW**	**M**	HALM01		No
PAC	**PAC**	**PA**	HALPA01		No
Photos			HAL01		-
Piezo	**Piezo**	**PI**	HALPI01		Yes
RCD	**RCD**	**RC**	HALRC01		No
RPS	**RPS**	**RP**	HALRP01		Yes
RWS	**RWS**	**RW**	HALRW01		No
SBP	**SBP**	**P**	HALP01		No
SDMT	**SDMT**	**D**	HALD01		Yes
SLU	**SLU**	**SL**	HALSL01		No
SP	**SP**	**SP**	HALSP01		No
Srefra	**Srefra**	**SRR**	HALSRR01		No
Srefle	**Srefle**	**SRL**	HALSRL01		No
SS	**SS**	**SS**	HALSS01		No

StandP	**StandP**	**S**	HALS01		No
THS	**THS**	**TH**	HALTH01		No
TS	**TS**	**TS**	HALTS01		No
VSP	**VSP**	**VP**	HALVP01		No
XBERT	**XBERT**	**XE**	HALXE01		No
XBGPR	**XBGPR**	**XG**	HALXG01		No
XBseism	**XBseism**	**XS**	HALXS01		No

* more than one file may be saved with additional identifiers explained in report

G1.4.1 00-Upload-SITENAME

This folder will be used to store data that is uploaded to Datamap.
While data will also be stored in the subsequent folders listed in Table 1 this folder is intended to be a carbon copy of Datamap. The structure will be the same as that described below. Each data file that is uploaded will have an associated image for upload.
The folder will only contain data that is uploaded to Datamap.

NGTS must have data from each site
P:\2016\01\20160154\Fieldwork\Halden\00-Upload-Halden
P:\2016\01\20160154\Fieldwork\Onsøy\00-ForUpload-Onsoy
P:\2016\01\20160154\Fieldwork\Oysand\00-ForUpload-Oysand
P:\2016\01\20160154\Fieldwork\Svalbard\00-ForUpload-Svalbard
P:\2016\01\20160154\Fieldwork\Tiller-Flotten\00-ForUpload-Tiller-Flo

G1.4.2 Interpretation of data stored separate to raw data

Folders for interpretation of raw data are to be set up as show in Table 1. The format of the folder name must follow that shown, for example Interp-ERT.

Files names should have the same Identification name here as in the raw data folders and may have additional text after the Identification name. However this may not always be the case as some data has already been collected and processed predating the guidelines in this document. **For new tests it is required that attention and due diligence is executed as shown in the naming convention and coordinate file by the Project Manager. They must emphasise this information to the site team who should use the correct names. After collection of raw data updating of file names and checking of Identification name is required as a quality control by the Project Manager. Changes that are required should be carried out by either the Project Manager or the person who collected that data. Both should be informed if changes are required.**

In situ stress and pore water pressure profile interpretation are saved in Interp-Stresses

G1.4.3 BH (Borehole)

Data file name	Figure file name
HALB03-Samplelist.xlsx	HALB03-Samplelist.jpg

This file is designed to record all samples from the field. Please note there are some drop down menus to select from.

G1.4.4 CPT-R-S-DIS (CPTU, SCPTU, RCPTU, Dissipation test)

This folder contains raw data from CPTU, SCPTU and RCPTU tests. Some of these tests will have dissipation tests.

Data file name (combined)	Data file name (from rig)	Figure file name
HALC01.xlsx	HALC01.std	HALC01.jpg
HALC02.xlsx	HALC02.std	HALC02.jpg
HALC03-DIS.xlsx	HALC03-DIS.std	HALC03-DIS.jpg
HALC04-R.xlsx	HALC04-R.std	HALC04-R.jpg
HALC05-R-DIS.xlsx	HALC05-R-DIS.std	HALC05-R-DIS.jpg
HALC06-S.xlsx	HALC06-S.std	HALC06-S.jpg
HALC07-S-DIS.xlsx	HALC07-S-DIS.std	HALC07-S-DIS.jpg

File name example:
HALC01.xlsx and HALC01.std
Additional information may be added to the file name (at the project managers' deaccession?). This is limited to standard identifiers for R, S and Dissipation tests listed in Table 2. The excel file contains heading with units.

.std file
There are two file types per test, as shown in the listed above. The .std fie latter is used in GEOSUITE. The name of the file must be the same as the name within the file to identify the file.

If a test has a and b, combine parts a and b in the excel file and save raw file with original a and b identifier after name. No spaces. Example HAL01a.std and HAL01b.std

Dissipation data is saved within the .std file.

Coordinates may be shown in the .std file however the Master Coordinate file is the Control for coordinate referencing and must be used for referencing if there is conflicting information.

HA=1,HB=23,HC=SY1220CQ00042,HD=20150512,HI=1209,HM=7,HJ=20150030,
HK=HALC02,HO=1.0,HN=20759,HT=342.3 9694.0 243.3 328.8 9706.0 263.3
D=1.07,B=24.3,A=6.62,U=22.9,Q=5.879,F=42.65,TA=1.6,O=8.5
Term definition
Units

HA=1,HB=211,HC=SY1220CQ00043,HD=20151021,HI=1706,HM=7,HJ=20150030,
HK=HALC10,HO=2.0,HN=20856,HT=493.8 10114.0 168.7 503.6 9994.0 168.0
#
D=2.01,B=7.2,A=0.0,U=34.82,Q=0.103,F=0.02,TA=0.0,O=0.0,M=0.00284171639670
3609,NA=0.000,NB=0.000,NC=0.000

Dissipation
$
HA=1,HB=211,HC=SY1220CQ00043,HD=20151021,HI=1718,HM=35,HJ=2015003
0,HK=sp8-12-rcptu,IC=4.961
#
AD=0.3,AG=91.600
AD=0.8,AG=102.100
AD=1.3,AG=107.500

.xlsx
For the excel file CPTU data is saved on Sheet1 of the .xlsx file.
Do not rename the Sheet1.
There should only be one tab with CPTU penetration data.
The units of parameters in the excel file may change from MPa to kPa. This will be updated in the file and correct unit is shown in the file. It is desired that parameters are presented in the units of the example file as this is in accordance with the ISO standard.

Dissipation data is to be saved on a separate tab in the excel file. One tab per dissipation test. The tab name for the dissipation tests is D-XX.XXm. There should be no spaces in the tab name. If more than one dissipation add tab. Example:
D-10.57m
D-5.53m

SCPTU data stored in the excel sheet is according to the following standard columns in Table 3 (NB – strike direction lined to 1 or 2, the sequence of strike in the field shall match the reported results).

Table 3 SCPTU - Vs interpretation reporting format

Shear wave $V_{s(vh)-1}$ (Left or Right)	Shear wave $V_{s(vh)-2}$ (Back or Front)	Uncertainty of $V_{s(vh)-1}$	Uncertainty of $V_{s(vh)-2}$	Regression coefficient for $V_{s(vh)-1}$	Regression coefficient for $V_{s(vh)-2}$
$V_{s(vh)-1}$	$V_{s(vh)-2}$				
m/s	m/s	m/s	m/s	-	-

G1.4.5 DBERT (Downhole ERT)

Data file name	Figure file name
HALDE01.dat*	HALDE01.jpg

G1.4.6 DBGPR (Downhole GPR)

Data file name	Figure file name
HALDG01.dat	HALDG01.jpg*

G1.4.7 DBseism (Downhole seismic)

Data file name	Figure file name
HALDS01.dat	HALDS01.png*

G1.4.8 EM (Electromagnetic)

Data file name	Figure file name
HALE01.dat	HALE01.png*

G1.4.9 EPCT (Earth pressure cell test (hydraulic, Glötzl))

Data file name	Figure file name
HALEP01.xlsx	HALEP01.jpg

G1.4.10 ERT (Electrical resistivity tomography)

Data file name	Figure file name
HALER01.dat	HALER01.jpg

Note figure for ERT saved in:

P:\2016\01\20160154\Fieldwork\00-Examples\Interp-ERT

Headings and units of data in ERT…..? What file is this?

Where the raw data file is edited due to pre-processing additional information about the edits may be added to the **Identifier** name. For example:
HALER01_noIP.dat

Need read me file on abbreviations after foundation name of file. (Maybe read me file?)

G1.4.11 FVT (Field vane)

Data file name	Figure file name

G1.4.12 GPR (Ground penetrating radar)

Data file name	Figure file name
HALG01.txt	HALG01.png
HALG01a.txt	

Need to know the headers in the file and units.
Name update.
What about image file – correct naming?
Why two text files?

G1.4.13 HFST (Hydraulic fracture stress test)

Data file name	Figure file name
ONSH01.xlsx	ONSH01.jpg

Have test files at Onsoy but need to select raw data file format.

G1.4.14 INC (Inclinometer)

Data file name	Figure file name
HALI01.txt	ONSI01.jpg

G1.4.15 MASW (Multichannel analysis of surface waves)

Data file name	Figure file name

G1.4.16 PAC (Pack test)

Data file name	Figure file name

G1.4.17 Photos

The photos folder for field work is an important folder and it is important that photos are saved here and not in the associated test type folders as then it is not clear how many sets of photos there are of if there is duplication. Hence this is the only place where photos from site should be saved.

It is important that photos are saved in a folder where the activity is noted on the name. If saving with date use YYYY-MM-DD. It is noted that photo files generally have date taken inbuilt in the meta data of the file.

G1.4.18 PI (Piezometer)

Data is recorded as .ptc files with the piezometer serial ID and the date and time stamp. The data in these files should be combined into the template excel file. Note that the logging puts the newest data first. It records in DD/MM/YYYY. Replace the comma with decimal for numbers in the excel file. The piezometer memory is limited to XX records. Circa 3 months interval for collecting data if logging at two intervals per day.

The .pvt files from the logger shall be saved and will be treated as a raw data file that may be upload together with the .xlsx combined files.

Data file name (From instrument)	Data file name (Combined)	Figure file name
pvt_9329_20160927_094108.pvt	HALPI01-HALPI04.xlsx	HALPI01-HALPI04.pdf
pvt_9330_20160927_094108.pvt		
pvt_9331_20160927_094108.pvt		
pvt_9332_20160927_094108.pvt		

G1.4.19 RCD (Rock control drilling)

Data file name	Figure file name

G1.4.20 RPS (Rotary pressure sounding)

Data file name	Figure file name
HALRP01.std	HALRP01.xlsx

HA=1,HB=24,HC=SY1220CQ00042,HD=20150512,HI=1302,HK=HALRP01,HM=23,HJ=20150030,HO=0.0
D=0.20,B=47.60,R=18,AQ=0,A=1.92,AR=0

G1.4.21 RWS (Rotary weight sounding)

Data file name	Figure file name

G1.4.22 SBP (Self boring pressuremeter test)

Data file name	Figure file name

G1.4.23 SDMT (Seismic dilatometer test)

Data file name (From rig)	Data file name (From NGTS)	Report file name (From NGTS)	Figure file name (From NGTS)
OYSD01_RAW.DTR	OYSD01_RAW.xlsx	OYSD01_Rep-SDMT.xlsx	OYSD01_RAW.PDF

G1.4.24 SLU (Slug test)

G1.4.25 SP (Self polarisation)

G1.4.26 Srefra (Seismic refraction)

G1.4.27 Srefle (Seismic reflection)

G1.4.28 SS (Simple Sounding)

G1.4.29 StandP (Stand pipe)

G1.4.30 THS (Thermistor string)

G1.4.31 TS (Total Sounding)

G1.4.32 VSP (Vertical seismic profiling)

G1.4.33 XBERT (Crosshole ERT)

G1.4.34 XBGPR (Crosshole GPR)

G1.4.35 XBseims (Crosshole seismic)

Appendix H

WEBSITE DATA SYSTEM FOR NGTS

Contents

H1 Datamap application

Following the steering committee 02-2017 it was decided to go forward with the "DataMap" application developed at the University of Western Australia to address the major challenge of capturing, classifying, organizing and making available geotechnical research data from the NGTS test sites.

The DataMap application uses Google Maps to display pins distributed across a site that represent test locations that have been defined by recording GPS coordinates (Figure 1). Each pin provides a link to data collected from that location. For convenience, data can be filtered by location (or Pin ID) and by data (or test) type. This provides an intuitive approach for indexing information using an interactive map and avoids information overload that occurs with a typical computer file system.

Datamap was developed to allow researchers to create and share “Projects”, and therefore provides a general platform for sharing geotechnical data.

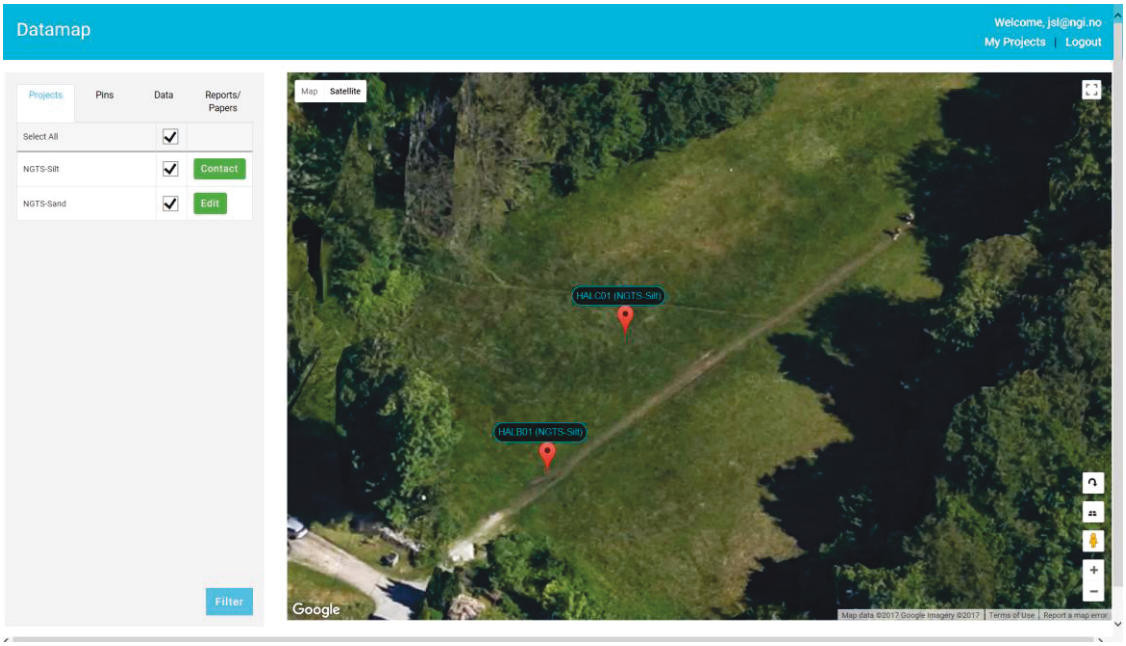


Figure 1: Print screen of the datamap application showing the Halden Research site with pins and the different project available to the user.

H1.1 Login and accessing the data

Access to the Datamap application and NGTS data can be accomplished in two steps. First, users register with the system at www.geocalcs.com/datamap
by creating a user name and password.

Once logged in, the user navigates to the "Join Project" tab (shown in Figure 2) by first clicking the "My Projects" link in the upper right hand corner of the map viewing screen. They then, must enter the details in Table 1 and click on the "Join Project" button. Users can then navigate back to the Map view by clicking a link in the upper right corner.

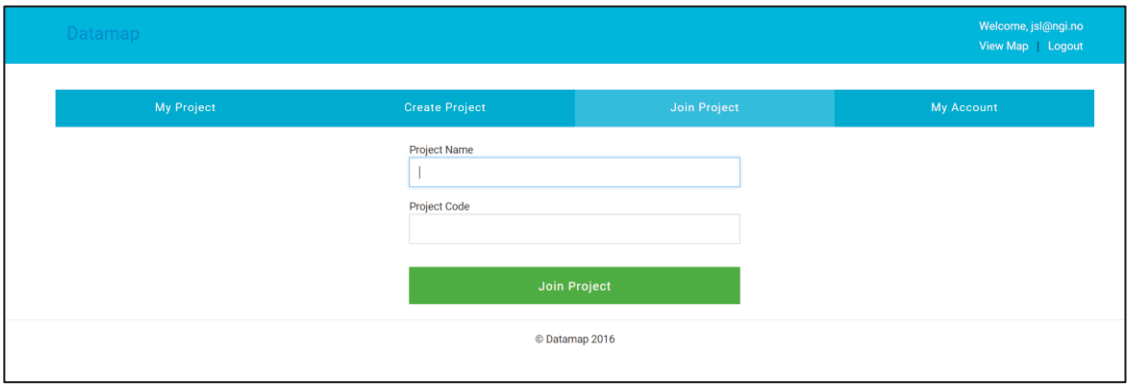


Figure 2: Join project window

Table 1: Login details to access the different NGTS site or projects.

Site	Project name	Project code
Halden	NGTS-Silt	NGTS2016
Øysand	NGTS-Sand	NGTS2016
Onsøy	NGTS-Clay	NGTS2016
Tiller	NGTS-Quick_Clay	NGTS2016
Svalbard	NGTS-Permafrost	NGTS2016

H1.2 Interacting with the data

In view mode, Google Maps is used to display pins that represent test locations across the site (see Figure 3). Each pin provides a link to data collected from that location.

When a pin is selected, the metadata (i.e. information about the data) associated with that pin is displayed (see Figure 4). This includes the "Data ID" and the "Data type" and an image that provides a preview of the data that is stored in the downloadable file. Files can be of any type, but are usually in the form of Microsoft Excel for raw data and pdf for reports. The preview images are png or jpeg files and these can also be selected and saved locally.

The left side of the screen provides users with the ability to filter the data by Pin ID or "Data type", so that information of interest can be easily identified. For example, if a user is interested in "Triaxial" data only, then the box next to the "Triaxial" can be selected and after selecting the "Filter" button, only pins that contain triaxial data remain visible

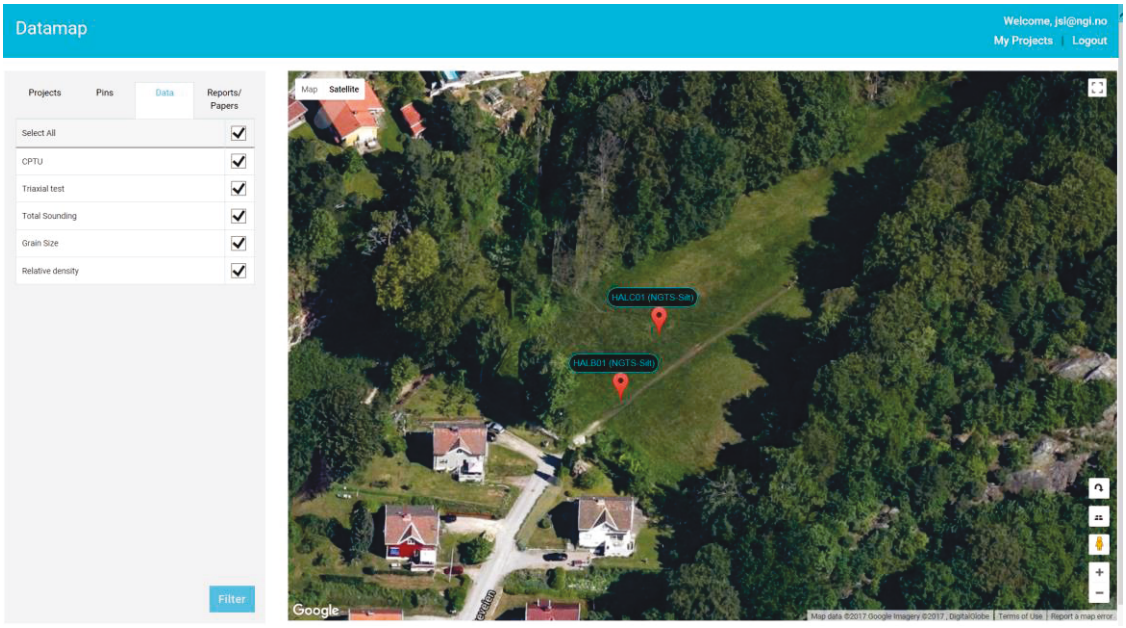


Figure 3: Datamap overview with availability of geotechnical soundings at the site.

Figure 4: Pin selection with image previewing the data in Datamap.

H1.3 Creating projects and adding data

Datamap was developed as a general platform to enable researchers to create their own projects and share data. A user can create a project by selecting “My Projects” from the Map view screen and selecting “Create Project”.

A project name must be entered, along with a project code. These details are required by other users to access the data contained within the project. Access details can be shared with selected colleagues and treated much like a secure user name and password, or, as in the case with the NGTS project, they can be published to allow anyone to access the data. A “terms and conditions” message can also be specified, so that when a user joins the project, they must agree to specific terms and conditions in accessing the data. The present "terms and conditions" message reads as:

"The data is the property of NGI and NGTS.
It cannot be used without the permission of NGI and NGTS.

Once a project is created it can be selected for editing from the list of projects. There are four main menu options in editing a project. Pins can be added to the map under “Manage Pins”. This can be done using a street address, by specifying latitude and longitude or by clicking and dragging an interactive pin on a map. Managing data types simply involves specifying the types of data that will be contained within the project so they can be sorted or filtered later. Managing data files involves uploading data files and associating them with an existing pin and data type and (optionally) adding a png or jpg file that provides a preview to the data (for example the images that can be seen in Figure 4). Under ‘Manage Project Members’, users who have joined the project can be seen and selected users can be given extra user privileges that allow them to add or remove data.

H1.4 System architecture

Datamap was built for the Amazon Web Services (AWS) cloud platform. The system architecture, illustrated in Figure 5, consists of an elastic load balancer distributing traffic between AWS EC2 instances that act as web servers in separate AWS availability zones. An EC2 instance is a virtual server in Amazon’s Elastic Compute Cloud (EC2) for running applications on the Amazon Web Services (AWS) infrastructure. All data files are stored in Amazon S3, which is a secure, durable and highly-scalable object storage service. The locations of files on S3 are stored as compact strings in a MySQL database, which also stores user details and other project related metadata.

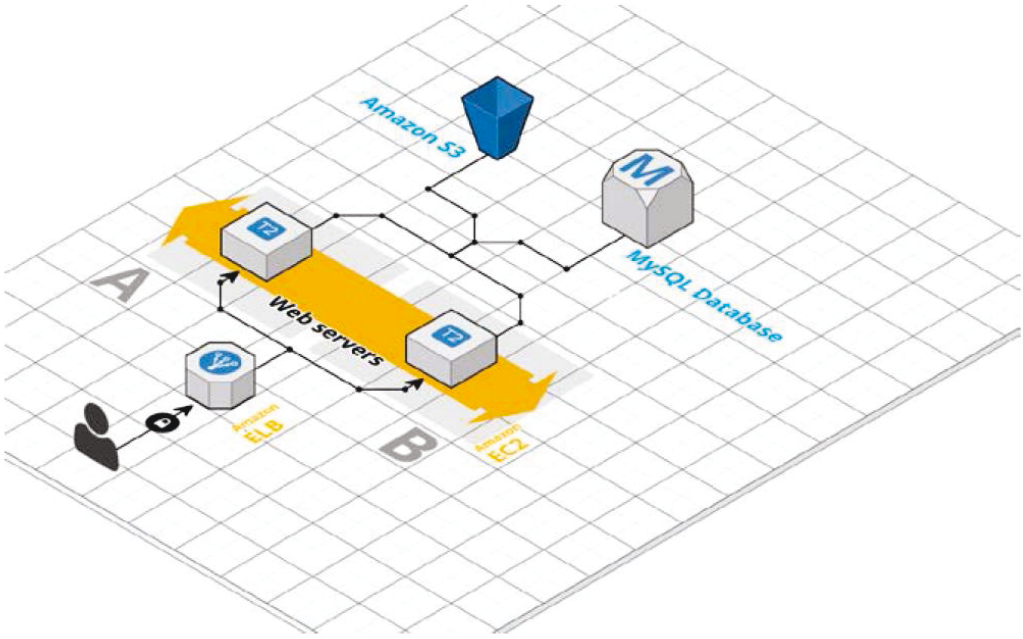


Figure 5: System architecture (from Doherty et al. 2017).

NEWS LETTER – MONTH 2017

NGTS Project Update

HEADING

You can use a sidebar for a short story about an important event or success story you want to highlight.

This is also a great place to showcase your goal or other content that you want to emphasize clearly in each edition, such as an upcoming event.

Caption (own style)

Heading 1

Text

Heading 2

Text

Heading 3

Text

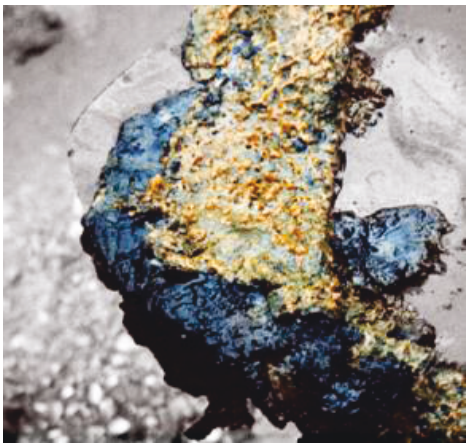
“ Highlight an important point or quotation"

Text text text Text text text"

Change picture

To change picture simply right klick om picture and select another one.

NEWS LETTER – MONTH 2017



Caption (own style)

HEADING IN BOX

Text in box (own style)

NGTS

Contact
[Firmanavn]
[Address)
[Post no and Place}
[Phone]
[E-mail]
[URL]

Appendix J

Communication Plan for NGTS

KOMMUNIKASJONSPLAN

Norwegian GeoTest Sites (NGTS)

DOK.NR.
REV.NR. 0 / 2017-01-24

Prosjekt

Prosjekttittel:	Norwegian GeoTest Sites (NGTS)
Dokumenttittel:	Kommunikasjonsplan vedr. intern og ekstern formidling
Dokumentnr.:	20160154
Dato:	2017-01-24
Rev.nr. / Rev.dato:	0 /

Oppdragsgiver

Oppdragsgiver:	Research Council of Norway (RCN)
Kontaktperson:	Herman Fabrot
Kontraktreferanse:	RCN project number 245650

for NGTS

Prosjektleder:	Jean-Sebastien L'Heureux, NGI
Utarbeidet av:	Nicholas Lundgard, NGI
Kontrollert av:	

Sammendrag

Denne kommunikasjonsplanen er ment som et verktøy til deg som partner, bidragsyter og deltaker i forskningskonsortiet. Hensikten er å gi en felles bakgrunn og forståelse, informasjon og hovedbudskap om FoU programmet Norwegian Geo Test Sites (NGTS). Innholdet i planen kan brukes til å besvare eventuelle spørsmål fra kolleger, kunder, interessenter og media.

Innhold

Kontroll- og referanseside

1 Bakgrunn

Denne kommunikasjonsplanen er ment som et verktøy til deg som partner, bidragsyter og deltaker i forskningskonsortiet. Hensikten er å gi en felles bakgrunn og forståelse, informasjon og hovedbudskap om forskningsinfrastruktur programmet Nasjonale Geoforsøksfelt (NGTS) eller "*Norwegian GeoTest Sites"* på engelsk. Innholdet i planen kan brukes til å besvare eventuelle spørsmål fra kolleger, kunder, interessenter og media.

Som partner, bidragsyter og deltaker kan kommunikasjonsplanen brukes som bakteppe til å besvare spørsmål, formulere budskap, innlegg, rapporter m.m. med egne ord. Ved å være omforente i budskap og bakgrunn i kommunikasjonen, både internt og eksternt, sikres en gjenkjennelighet og en trygghet i kommunikasjonen rundt FoU programmet NGTS.

NGTS vil over tid samle resultater, nyheter, innlegg m.m. på en egen, selvstendig webside med tilhørende ekstranett for innlogging og utveksling av filer og informasjon internt i forskningskonsortiet. Den selvstendige websiden for NGTS vil forventelig stå klar i begynnelsen i 2017. Inntil da kan informasjon og fakta om FoU programmet finnes på NGIs webside ved å følge dette linket: http://www.geotestsite.no

1.1 Hva går programmet ut på?

Et samarbeide mellom NTNU, SINTEF, UNIS, Statens Vegvesen (SVV) og NGI har resultert i FoU-programmet NGTS, på norsk Norsk Geo forsøksfelt. FoU programmets formål er å utvikle felt-laboratorier for testing, verifisering og kontroll av nye metoder og utstyr for grunnundersøkelser og fundamenteringsmetoder. Forskningskonsortiet ledes av NGI.

Forsøksfeltene vil brukes som feltlaboratorier for uttesting og verifisering av nye, innovative metoder for grunnundersøkelser og forsøksprosedyrer. De fem forsøksfeltene er valgt ut som representative for en type løsmasse, som omfatter; bløt leire, kvikkleire, silt, sand, permafrost (frossen jord).

Grunnet økende interesse for bygging og energiløsninger under arktiske forhold, vil ett av forsøksfeltene etableres i permafrost, hvor prøvetaking, in situ forsøk og laboratorieundersøkelser av frosset jordmateriale er meget utfordrende.

Forskningskonsortiet initierer et "International Geo-Test Sites Network", hvor norske brukere vil få adgang til utenlandske forsøksfelt og kvalitetssikrede data. Gjennom nettverket og kompetanseutveksling vil norske brukere få førstehånds kunnskap om nytt utstyr og nye metoder som utvikles av de mest kjente forskningssentrene internasjonalt.

2 Målgrupper

2.1 Internt:

- Intern styringsgruppe og prosjektledelse i forskningskonsortiet.
- Medarbeidere ved alle partnere i FoU-programmet.

2.2 Eksternt:

- Samarbeidspartnere i Norge og utlandet.
- Akademia i Norge og utlandet.
- Nåværende og fremtidige kunder av de respektive partnere i FoU-programmet.
- Media.
- Offentligheten.

3 Talspersoner

Ved offisielle uttalelser til samarbeidspartnere, kunder, media m.fl., er det kun følgende personer som 1) bør uttale seg om NGTS formål, mål og funn, og/eller 2) kan utpeke personer som kan uttale seg på vegne av forskningskonsortiet og FoU programmet NGTS:

- Jean-Sebastien L'Heureux, Prosjekt Leder, Geoteknikk og Naturfare, NGI Trondheim
- Lars Andresen, administrerende direktør, NGI
- Xxxx, SVV
- Xxxx, SINTEF
- Xxxx, NTNU
- Xxxx, UNIS
- Xxxx

4 Kommunikasjonsmål

4.1 Internt (proaktiv)

Informere om FoU-programmet NGTS, herunder viktigheten av prosjektet på kort og på lang sikt – for forskningskonsortiet og for andre, potensielle interessenter i fremtiden, slik at medarbeidere på NGI, NTNU, SINTEF, SVV og UNIS er kjent med satsningen.

Målet er at medarbeidere har *kjennskap* til FoU-programmet NGTS, at avdelingsledere/områdedirektører/nøkkelpersonell har *forståelse* for det viktigheten av FoU-programmet, og at spesielt sistnevnte kan svare på spørsmål ved henvendelse fra

medarbeidere/kunder/samarbeidspartnere og/eller henvise til rett kontakt i FoU-programmet NGTS for svar.

4.2 Eksternt (proaktiv)

Den eksterne kommunikasjonen til kunder/stakeholdere/samarbeidspartnere/media skal synliggjøre den strategiske satsningen med FoU-programmet NGTS, hvordan funn fra de fem forsøksfelt kan bidra til mer helhetlig rådgivningstjenester og viten om grunnforhold generelt.

Målet er å skape *kjennskap* til NGIs og forskningskonsortiets satsning innen nasjonale geoforsøksfelt, herunder potensialet rundt funn i forbindelse med prosjektets gjennomførelse. I tillegg er det et mål å sikre *synlighet* i både egen, fortjent og betalt kommunikasjon.

5 Hovedbudskap

- En økende befolkningstilvekst og større behov for ny infrastruktur (broer, havneanlegg, veier, jernbaner, drikkevann og kloakkanlegg m.fl.), er med til å skape behov for å bygge og bo på sikker grunn, og kunne minimere påkjenninger fra ekstremvær.
- Forskningsprosjektet NGTS er et samarbeid mellom UNIS, SINTEF, SVV, NTNU og NGI, og består av fem nasjonale forsøksfelt nær henholdsvis Oslo, Trondheim og på Svalbard. Feltene vil ha en driftsfase på minst 20 år.
- Forsøksfeltene vil fungere som feltlaboratorier for uttesting og verifisering av nye grunnundersøkelsesmetoder og prosedyrer, og vil fungere som referanseområder for industri, offentlige byggherrer, forskningsinstitutter og akademia.
- Resultatene fra NGTS vil blant annet kunne kartlegge metoder for å utvikle mer kostnadseffektive og bærekraftige løsninger for bygging av infrastruktur, samt tiltak for å redusere farene forårsaket av klimaendringer, flom og skred.

6 Mulige kritiske aspekter

- Negativ reaksjon fra både interne og eksterne målgrupper grunnet manglende anvendelige resultater på kort sikt (med andre ord; lang tidshorisont for prosjektet underminerer viktigheten og formidlingen).
- Den proklamerte satsningen med investeringen og etableringen av fem forsøksfelt har ingen reell oppfattet og/eller økonomisk effekt for samarbeidspartnere, akademia, industrien, samfunnet m.fl.
- Xxxx?

7 Spørsmål og svar

Q: Hvor stort er budsjettet for å etablere FoU programmet NGTS?
A: Budsjettet er på 61 MNOK og er finansiert med 66 % fra Forskningsrådet, 23 % fra forskningsinstituttene og 11 % fra offentlig sektor.

Q: Hvor lang tid vil prosjektet løpe over?
A: Etableringen av de fem forsøksfeltene og igangsetting av prøvetaking, datainnsamling og drift av feltene, vil løpe over tre år fra 2016 til og med 2019. Dernest vil de fem forsøksfeltene være operative og driftes ved behov de etterfølgende 20 årene.

Q: Hva er formålet?
A: De fem forsøksfeltene vil brukes som feltlaboratorier for uttesting og verifisering av nye, innovative grunnundersøkelsesmetoder og forsøksprosedyrer. Ved prosjektets slutt, vil forsøksfeltene brukes som referanseområder ("benchmark") benyttet av industri, offentlige byggherrer, forskningsinstitutter og akademia. Data generert ved forskningsfeltene vil kunne brukes for å videreutvikle geotekniske metoder og heve kunnskapsnivået.

Q: Står investeringens mål med forventede besparelser for samfunnet og industrien?
A: Xxxx?

Q: Er det kun norske virksomheter, institutter og organisasjoner som kan bruke feltene fremover?
A: Nei. Xxx.

Q: Hva forventer man å finne ut av med prosjektet?
A: Xxx?

Q: Hvilke funn kunne tenkes å komme frem med NGTS som vil være revolusjonerende for bygging av fremtidig infrastruktur? Eksempler?
A: Xxx?

Q: Vil medarbeiderne i forskningskonsortiet jobbe fulltid med prosjektet?
A: Xxx?

Q: Blir prøver, data og resultater tilgjengelig for alle – og hvordan?
A: Xxxx?

8 Roller og ansvarsområde

Overordnet eier av kommunikasjonsplanen	Jean-Sebastien L'Heureux, NGI – prosjektleder på FoU programmet NGTS
Formidling av informasjon internt og eksternt til målgruppene	Kommunikasjonsavdelingen, NGI – støttet av kommunikasjonskrefter hos prosjektet partnere
Ansvarlig for å oppdatere kommunikasjonsplanen	Nicholas Lundgard, NGI – støttet av Jean-Sebastian L'Heureux, NGI
Kontaktpersoner ved henvendelser fra media (se også talspersoner)	Jean-Sebastien L'Heureux, NGI Lars Andresen, NGI Nicholas Lundgard, NGI
Talspersoner	Jean-Sebastien L'Heureux, NGI Lars Andresen, NGI Xxxx, SVV Xxxx, SINTEF Xxxx, NTNU Xxxx, UNIS Xxxx

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