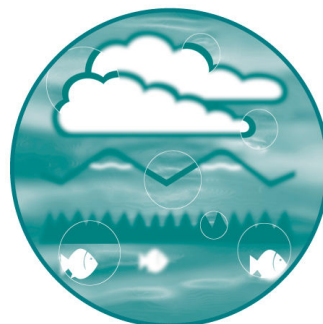
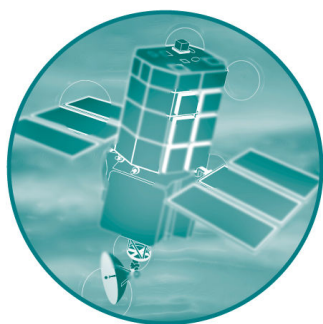


Joint Defra / EA Flood and Coastal Erosion Risk Management R&D Programme



MDSF2 Main Development Phase - Initial Report



ENVIRONMENT
AGENCY

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Our work includes tackling flooding and pollution incidents, reducing industry's impacts on the environment, cleaning up rivers, coastal waters and contaminated land, and improving wildlife habitats.

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Science Project Reference No.: SC050051

Collaborator(s):

In alphabetical order

Science at the Environment Agency

Science underpins the work of the Environment Agency, by providing an up to date understanding of the world about us, and helping us to develop monitoring tools and techniques to manage our environment as efficiently as possible.

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Professor Mike Depledge

Head of Science

Executive Summary

This Report forms the Inception Report for the MDSF 2 Project.

Any queries regarding the content of the proposal should be addressed to Paul Sayers or Caroline McGahey at HR Wallingford.

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1 Introduction

This short report is based on the accepted proposal for MDSF2, but adds to it matters agreed at the project start-up meeting held on 23 March 2006. It is intended to provide users and stakeholders with a short accessible summary of the project

This phase of the project builds on the Inception Report dated June 2005 which set out development options for MDSF2 and presented the preferred options of the Project Board.

The present, initial Contract is for Task 1 only.

2 Overall objective

The overall objective of the project is to extend and improve the existing, first version of MDSF (MDSF1) to incorporate new and improved risk-based methods in order to provide a better and more consistent decision support tool for both the CFMP and SMP programmes, strategies and scheme appraisal.

The Modelling and Decision Support Framework (MDSF) was developed in 2001 to provide a tool for quantifying economic and social impacts of flooding at catchment scale for present day conditions, future scenarios and with flood management options. It has been applied widely for flood/erosion risk assessment as part of the Catchment Flood Management Plan (CFMP) and Shoreline Management Plan (SMP) programmes and has also been used on strategy studies and schemes.

The present version of MDSF, however, uses only a simplified representation of the role of defences and does not properly take account of defence performance in the analysis of risks and their management. This is a particularly crucial point in the context of understanding and managing the actual risk. MDSF2 will incorporate the RASP (Risk Assessment for Strategic Planning) approach that has been developed to take into account the performance of flood defences. The project will also address a number of software issues such as GIS platform which have been obstacles to widespread uptake within the Agency and will extend its scope to include portfolios of responses as envisaged by the Foresight Future Flooding project and Making Space for Water.

The benefits will be better and more consistent risk assessment and management over catchments, estuaries and coasts, and more efficient processing of CFMPs and SMPs.

The project will be carried out with a view to developing links with spatial modelling tools being considered for River Basin Management Planning under the Water Framework Directive.

3 Specific objectives for all tasks

1. To improve the present version of MDSF by incorporating an appropriate level of the RASP methodology to allow MDSF to assess the performance of defences better and thus support a full range of catchment, estuary and coastal flood planning and option appraisal tasks in an efficient, consistent and transparent way.
2. Build upon the present MDSF and the work of the RASP methods to produce in Task 2 and 3 an alpha tested item of software under an approved QA system which can be efficiently used by operating authorities and their consultants.
3. To put in links to other strategic systems and projects such as NFCDD, Flood Mapping Programme and PAMS, and to consider future links to similar systems in land and water quality.
4. To facilitate the inclusion (but not to include under this phase) the option appraisal of non-structural options such as rural and urban land management, flood event management and flood loss management thus laying a foundation for a tool which can support the Agency's policy of integrated flood risk management.
5. To ensure that software development is as far as possible 'future-proofed' by reducing to a realistic minimum its dependence on specific third party software; and to ensure that the software is modular, so that individual modules of MDSF2 can be re-used in other applications in the RASP family and vice versa.

In developing MDSF2 the needs for backward compatibility must be considered. This includes:

- Being able to read MDSF datasets
- Being able to re-run old data.

4 Target audience

The target audience is Agency staff concerned primarily with CFMPs, SMPs, strategy and scheme studies and the consultants engaged upon these tasks on behalf of the Agency. Effort will also be directed, where possible, towards satisfying the needs of the Local Planning Authorities working with the Agency on development planning; maritime Local Authorities and their consultants concerned with coastal flood management planning and studies; those responsible for the Making Space for Water implementation; devolved administrations in Wales, Scotland and Northern Ireland, but this will be a secondary objective.

5 Programme of work

5.1 Main Tasks

Phase 2 of the MDSF2 project will consist of developing a new version of the risk assessment, modelling and decision support tool (known as MDSF2) under 4 key tasks.

- Task 1 – System Design (initial contract)
- Task 2 – System Development for implementation
- Task 3 – Testing, documentation and handover
- Task 4 – Dissemination and uptake

The Agency will undertake both internal and external reviews. The internal review will be carried out by CIS. The external reviewer(s) will be arranged by PM & Client / Theme Manager.

The current Project Contract covers Task 1 (System Design) only. Extension to all other tasks will then be subject to the Agency exercising an option to extend the Contract. The content of all sections of this Specification are, however, required to achieve the objectives, deliverables and outputs of the Project as a whole.

The proposed project builds upon the detailed study undertaken as part of the Inception Phase for MDSF and includes the following priorities:

Table 5.1 Core enhancements

Priority	Ref from Inception Report dated June 05	Item
Must have	R1-R4	RASP: refinement of methodology and software
	R5	Easy viewing of input data
	G1-G4	GIS platform change to be independent as practical
	O1	Implement MDSF1 methods on new platform
	O2	User manual and guidance
	O3	Enhanced economic damage calculation 1
	O6	Socio-economic impact assessment improvement
	O12	Interaction with NFCDD
	O15	Mapping of social and emergency response
		Internal (alpha) test of system
		Liaison with Beta testers and review of results

Additional enhancements will be considered during Task 1 and recommendations made in the Task 1 report. Additional priorities will then be agreed by the Project Board where appropriate. However the further enhancements will be depend on available budgets and the opportunity for partnership development with other projects; including other joint Defra/Agency FCERM R&D, FRMRC, FLOODsite, TE2100 projects. The possible options for further development are outlined below in Table 5.2 (taken from the MDSF2 Inception Report – June 05).

Table 5.2 Other possible enhancements to be considered in Task 1

Priority	Ref	Item
Items required but not fully defined at present	R6	RASP for non-linear defences (method and software)
	R7	Time dependent issues (method and software)
	R8	Improve uncertainty analysis (method and software)
	O10	Risk assessment of coastal erosion
	O13	Enhanced economic damage calculation 2
	O14	Enhanced economic damage calculation 3
	O17	Improve links to appraisal methods
	O22	Risks to people
Items required but funding may be outside R&D budget		External (beta) test of system: CFMPs
		External (beta) test of system: SMPs
		Dissemination roadshow
		Guidance documents for application to CFMPs, SMPs and Strategy Studies

Note:

The core enhancements provided in Table 5.1 is a more restricted list compared to Table 5.1 of the MDSF 2 Inception Report. This reflects the additional activities required to deliver a MDSF2 project (for example functional design, system design report and others) not explicitly costed within the Inception Report. It may be possible, however, to deliver some of the above items within the budgets outlined, as some work has already been completed under NADNAC 2006 and TE 2100 projects and elsewhere. The use of these synergies will be explored in Task 1 to ensure no duplication, however no guarantee is given here and additional funds maybe required to deliver these non-core enhancements.

5.1.1 Task 1 – System Design – Initial Contract Task

Task 1 will involve the following activities:

Task 1a - Develop overall conceptual approach for MDSF 2 (requirements and methods) – this will be led by HR Wallingford in association with Wallingford Software, Halcrow and University of Middlesex. It will set out the overall approach and philosophy to MDSF2 that builds upon the MDSF 2 Inception Report in accordance with the “Scoping the development and implementation of Flood and Coastal Risk Models” (SC050065) study. It will include: outline methods (including the source, pathway and receptor terms); outline approach to integration (both probabilistic and deterministic as suggested in the Inception Report); linkage to wider initiatives; as well as principles of the overall software architecture including coding standards and principles. The latter will be in accordance with the recommendations and outputs of project FD2121 (see below).

Task 1b - Review of IT issues including liaison with EA – This will be led by Halcrow, building on work they have recently been commissioned to do by the MAR Theme (FD2121) and will provide a detailed view of all IT issues and requirements of the Agency’s CIS. In particular Halcrow will use details of all Agency CIS standards, testing and acceptance documentation and act to assist CIS in finalising their Technical Assessment for the project. It will be important at this stage to agree with CIS the recommended software architecture and assist CIS in the preparation of any documents required to obtain approvals in accordance with CIS procedures. The task will also

include agreeing with CIS the exact procedure and criteria for testing and acceptance. (Note that the (limited) time inputs proposed for this sub-task assume that the FD2121 project will have progressed sufficiently well to significantly assist this project – it is expected that FD 2121 will take approx 3 months to complete.) A date of the 28th April has been agreed for a joint meeting between this project and FD 2121 and CIS.

Task 1c - Detailed Requirements – A Definition – This will involve a significant expansion (in terms of detail) of the requirements statements included in the Inception Report. It will include details of the expected outputs of the MDSF2 modules. ‘Use cases’ will enable the processes of user interaction and input-to-output data transformations to be understood. Non-functional requirements will be identified and appropriately specified, including performance issues, hardware/software/GIS platform requirements and interoperability with other systems (NFCDD). Acceptance and test plans will be drafted (to define the success criteria). The detailed requirements will be brought together in a formal detailed requirements report that will be subject to stringent version control and will be subject to sign off by the client (to help manage potential scope creep). This will also include discussion of issues associated with backwards compatibility and use of third party software. This task will be led by Halcrow with input from others. The output from this task will be sufficient to enable software to be developed.

Task 1d - Assessment of flood probability - outlining approach to be included in MDSF2 – This will be led by HR Wallingford and will provide a outline methodological approach for including an appropriate level of RASP into MDSF2; including both the source (loading) and pathway (i.e. fragility and inundation) terms. It will also outline how traditional methods can be integrated with the more rigorous RASP based methods.

Task 1e - Assessment of impacts - outlining approaches to be included in MDSF2 - This will be led by Halcrow (with input from HR Wallingford and FHRC) and will provide a outline methodological approach for including receptor impacts and summary impact analysis into MDSF2; this will include link to the format of flood probability expected from the previous task and will demonstrate how a wide range of receptors impacts could be implemented and highlight those for inclusion in MDSF2 (and taking forward in Task 2). The outputs from the task will be documents which clearly define the algorithms, input and output data required for the specific impact modules.

Task 1f - Functional Design – The functional design will be developed from the outputs of the foregoing reports. It will include: overall system architecture, definition of how the system interacts with other systems, definitions of components, activity diagrams explaining object and process interaction. Details of input and output data requirements will be provided. Prototypes, example screen layouts and screen flows (storyboards) will be developed to enable the expected user interaction with the system to be understood and explained to interested parties. Rejected design alternatives will be described with justifications. Implementation aspects will be discussed, such as coding guidelines, development environment and unit testing requirements. The overall system architecture will be consistent with the FD2121 framework due to be developed (key attributes being modularity and openness). Halcrow will lead this task. Wallingford Software will then act to review the functional specification to ensure the governing software principles are accommodated.

Task 1g - System Design Report – HR Wallingford will lead the development of an overall system design report that includes (or references) the findings from all the above. The report will include detailed plans for Tasks 2, 3 and 4 including testing and dissemination. The report will be produced and submitted to the Agency at the conclusion of the Task 1 for approval by the Project Board prior to starting Tasks 2 to 4.

Linkages

A number of possible linkages could be made at this stage. However to ensure the project remains focused on delivering the proposed key improvement associated with including the current RASP frameworks and updating the GIS platform it should be noted that no significant effort will be made to consider the following:

- Wider use of MCA methods at this stage
- Linkages to integrated urban drainage plans (would need significant further work to scope)
- Linkages to Water Framework Directive (would need significant further work to scope)
- Tools to assist implementation of FD2114 - land management impact on flood generation.
- Inclusion of erosion risk methods – RACE is still under development and is not yet ready for inclusion (existing methods in MDSF 1 will of course be propagated to MDSF 2).

It is recognised however that every effort should be made to ensure the system is flexible and able to incorporate, at a later stage (and under a different project), such linkages.

5.1.2 Task 2 – System Development – Upon exercise by Agency of Option

Task 2 can be considered as split into two activities as follows:

Completion of methods and system definition.

- ***Assessment of flood probability (sources and pathways)*** - detailing of methods to be included within MDSF2 – This will be led by HR Wallingford and will extend the work completed in Task 1 to detail the methodologies and algorithms for analysis the source and pathway terms to be included in MDSF 2.
- ***Assessment of impacts - detailing of methods to be included within MDSF2*** – this will be led by Halcrow and will extend the work completed in Task 1 to detail the methodologies and algorithms for analysis impact terms and impact summary functionality to be included in MDSF 2.
- ***Detailed design of MDSF2 software (finalise)*** – this will be led by Halcrow and will finalise the detailed design of MDSF 2 software building upon the functional design and the developments outline in the above two activities.

Software development

- ***System quality control - implement and manage version control and updates*** – this will be led by Wallingford Software and will set-out the quality procedures and controls to be utilised in the development of the MDSF 2 software. Wallingford

software will also manage the version control process taking responsibility for each software release.

- **Coding 1 – Create new software framework** – this will be led by Halcrow and will provide the backbone of the MDSF2 framework
- **Coding 2 – Update of MDSF1 software / functionality** – this will be led by Halcrow and will enable the existing MDSF1 functionality to be maintained in MDSF 2.
- **Coding 3 – Implement selected RASP method within MDSF (sources and pathways)** – this will be led by Wallingford Software and will incorporate the RASP methods into the MDSF2 software
- **Coding 4 - Implement selected impact assessment and summary functionality (to include as a minimum)** – the extent of the work proposed under this sub-task will depend upon the availability of products / tools from parallel activities and the findings of Task 1. The only work proposed directly under this contract at present is associated with improving social and emergency response mapping elements and the development or an enhancement economic appraisal functional based on item O3 of the Inception Report. This activity is to be led by Halcrow with inputs from HR Wallingford.
- **Final system integration of MDSF2 (in preparation for testing)** – This is to be led by Halcrow and includes the final agreement of the MDSF2 software. Wallingford Software will be responsible for final review and issuing the software release.
- The task will commence on receipt of approval of the System Design Report. The end-deliverable will be the software ready for Task 3.

5.1.3 Task 3 – Testing, documentation and handover – Upon exercise by Agency of Option

Task 3 will involve:

- **Alpha testing** – at two sites (one led by HR Wallingford and the other Halcrow). The alpha testing will be carried out in-house by staff not engaged on the main project and has been included in the tender price.
- **User Guide, Technical Support Notes, Final Project Record** - A final report will be included (first in draft and then final form – assuming one iteration with the Project Board) together with user documentation and associated Technical Notes. This will be supplied to CIS once approved by the Project Board on completion of the alpha testing. This task will be completed upon acceptance of the software and supporting documentation in accordance with Agency procedures as agreed in Task 1 and will be provided to the organisations involved in the beta testing.
- **Beta testing** - Beta testing will be carried out by others. A budget has been included in the detailed plan for the project for issuing software, user guides and testing instructions to testers, providing training and support, taking note of their experience and comments and finalising the code and documentation in the light of these. (The

number and type of tests will need to be agreed with the Agency in Task 1, but as a guide for pricing an allowance has been made to support 3 beta test projects.) (It is anticipated that this support will be lead by HR Wallingford with support from Halcrow – however costing of this element has been excluded from the costings for Task 1)

5.1.4 Task 4 – Dissemination and uptake – Upon exercise by Agency of Option

With regard to dissemination and uptake for Task 4, the following approach is proposed based on the lessons learned in the early launch of MDSF, and the successful support provided to MDSF during 2004 and 2005:

- Prepare dissemination materials for presentation purposes. The materials should clearly demonstrate what MDSF2 does and how it fits with the Agency's procedures for CFMPs, SMPs, Strategy Plans and other Flood Risk Assessments.
- Prepare training materials and apply them internally by non-MDSF staff to ensure that they are suitable for use by potential users.
- Establish dissemination and uptake arrangements similar to the current arrangements for the MDSF. This should be set up before the dissemination process begins to ensure that potential users have immediate support for dealing with queries.
- Undertake a roadshow to each Environment Agency Region to present MDSF2 to both Agency and Consultant staff.
- Support the use of MDSF2 by individual users, including 'hands-on' training.

The specific tasks are discussed below in further detail.

This task will be led by HR Wallingford with inputs from Halcrow and involves:

- Dissemination materials;
- Prepare training materials;
- Establish support arrangements (although the cost for this is excluded from the current tender budget bid)
- Roadshow;
- System support (including training) (although the cost for this is excluded from the current
- Development and extension of present website www.mdsf.co.uk.

In addition to the above the following deliverables will be included:

- Technical Summary – draft following within two weeks by a Final
- Technical Report – detailing the project activities, methods, approaches and software

Both reports will be provided in Agency formats, as well as the material particular to software and its use listed above.

5.1.5 IPR and independence from external software

As noted in the Specific Objectives, the Agency is very concerned not to be caught by dependence on third party software which then changes or has high costs associated with it. This has proved to be a major problem for the original MDSF.

The IPR for the existing MDSF belongs to the EA. The EA does not wish to increase 'bought-in' IPR in MDSF2, and all newly created IPR for MDSF2 will therefore belong to the EA. Any conflicts with new or existing HRW, WSL and Halcrow agreements, which will have to be resolved. The balance between the costs of developing "own" functions against the cost of licensing them must be considered.

5.2 Decision gateway - Undertaking the work

Given the exploratory nature of Task 1, it is understood that the Agency wish to include a Gateway in proceeding from Task 1 to Tasks 2-4. As such the following conditions of working are understood:

- The present, initial Contract is for Task 1 only.
- At the end of Task 1 and the submission of the System Design Report the Agency will review and consider the system design, and will give its approval and/or comments within a period not exceeding one month. Subject to the scope of the comments the Agency may request the contractor to submit revised costings and programme for the remaining Tasks 2, 3 and 4.

5.3 Project Staff, Management and Organisation

The Project Team has been constructed from the following organisations:

- HR Wallingford (Lead)
- Halcrow
- Wallingford Software
- Flood Hazard Research Centre, Middlesex University

The project team, comprising the appropriate skills for the tasks specified, is provided in Figure 4.1.

The Project Manager will be Paul Sayers supported by Caroline McGahey as Deputy Project Manager and David Ramsbottom as overall Project Advisor. The Halcrow team will be led by Jon Wicks, inputs from FHRC will be led by Edmund Penning-Rowell and Rob Millington will lead the inputs from Wallingford Software inputs.

A Project Risk Register will be set up and maintained.

Summary of key Project Team Members

Name of resource	Position
HR Wallingford Paul Sayers Caroline McGahey David Ramsbottom	Project Manager Deputy Project Manager Project Technical Advisor

Ben Gouldby Mike Panzeri	RASP –Technical Specialist RASP and GIS Specialist
Halcrow Jon Wicks Matt Scott R Honeywell N Andrassy O Jarrett	Project Manager – Halcrow Halcrow technical lead Halcrow software development lead Halcrow software development Halcrow software development
Middlesex University Prof Edmund Penning-Rowsell	Project Manager – Middlesex University
Wallingford Software David Fortune Rob Millington Martin Wills	Technical Director – Wallingford Software Project Manager – Wallingford Software Software Developer

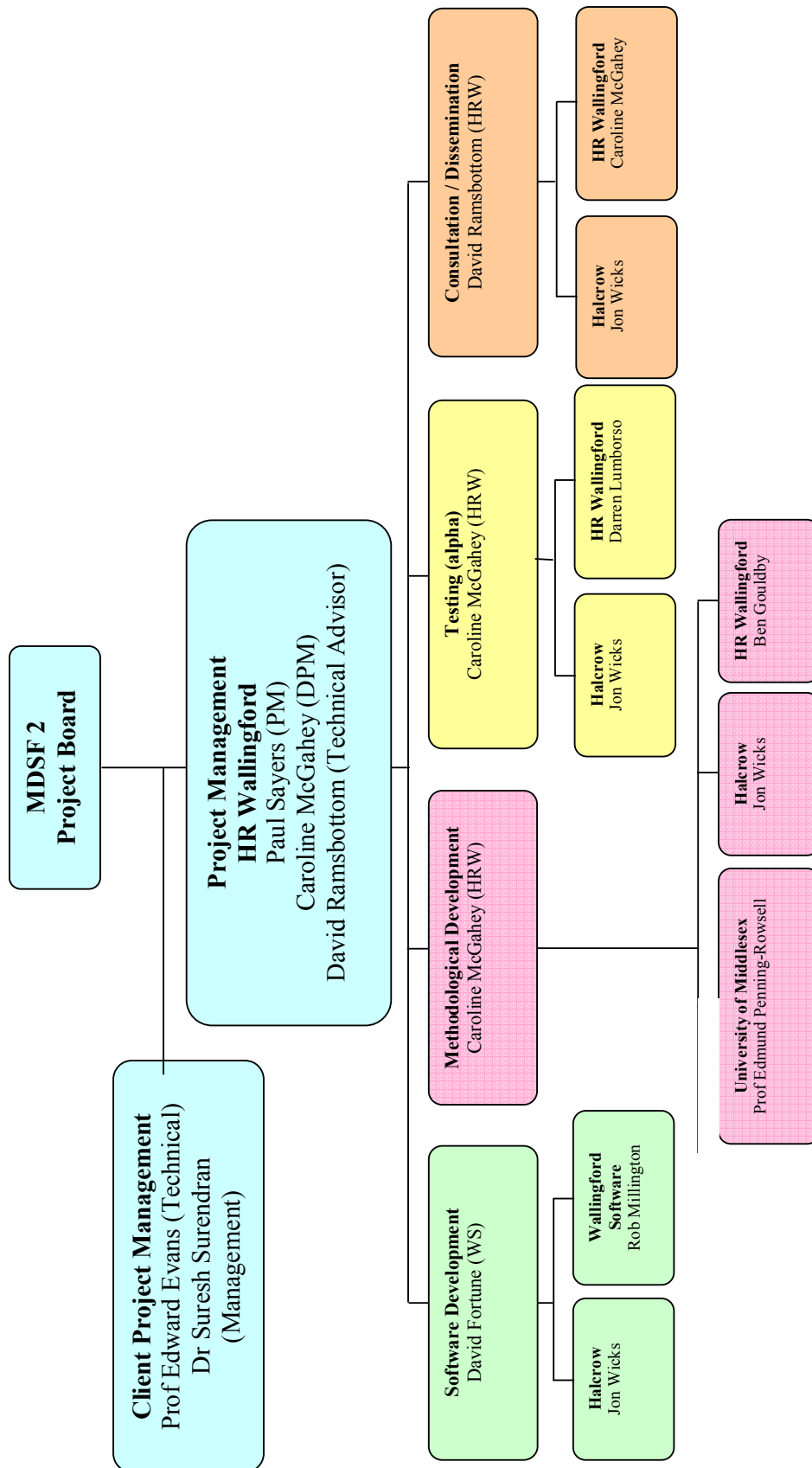


Figure 4.1 Project Organisation

The HRW Project Manager and the Client Project Manager (Technical) will be responsible for internal liaison matters. All contract details will be between the HRW Project Manager and the Agency Project Manager.

5.4 Programme

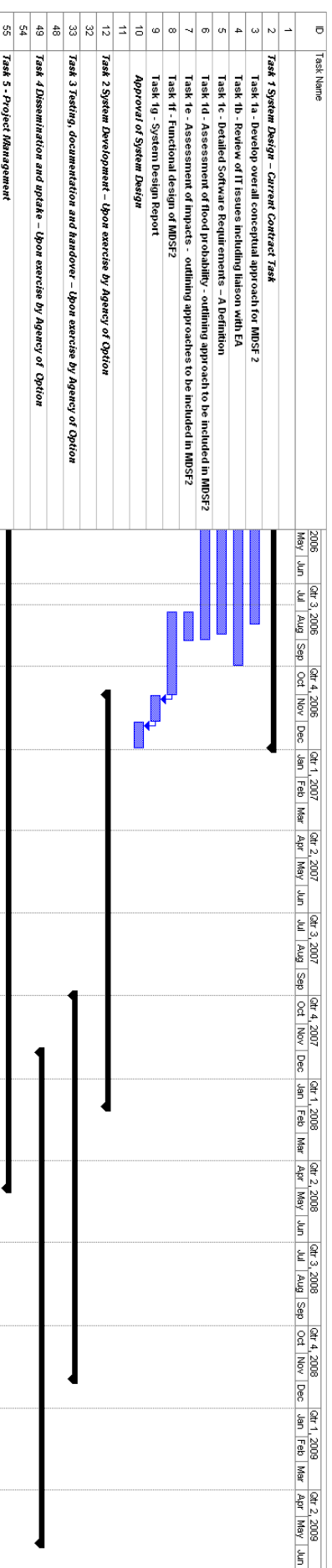
This includes time for Approvals to proceed at the end of Task 1 and an allowance has been made for Project Board meetings and regular progress meetings, including a project start-up meeting, quarterly task progress meetings a project closure. It is however noteworthy that, although Task 1 is in line with the specified indicative duration, the project programme as a whole is longer than within the Specification. This reflects discussions within the Proposed Team, however the final details of Tasks 2-4 will be agreed at the end of Task 1 and the final programme will be agreed at that stage.

Start Date May 2006															
Project month		1	4	7	10	13	16	19	22	25	28	31	34	37	
Calendar month		May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	Aug	Nov	Feb	May	
Task	Description														
	Part 1														
1	Task 1 – System Design														
	Part 2														
2	Task 2 – System Development														
3	Task 3 – Testing, documentation and handover														
4	Task 4 – Dissemination and uptake														

Figure 4.2a Proposed overall programme (overview, will be reviewed at the end of Task 1)

A Project Risk Register will be set up and maintained.

Figure 4.2b Programme (Task 1 - detailed)



6 Milestones and deliverable dates

6.1 Milestones

Table 6.1 shows delivery dates for key milestones within the Programme. It should be noted that these extend the dates provided in the Specification for a number of reasons and are believed to be realistic and achievable given the complexity of some elements. The details of Tasks 2-4 programme will, of course, be agreed at the end of Task 1.

Table 6.1 Indicative delivery dates

Task No.	Deliverable	Responsible party	No. of copies	Date of completion, end:	Proj mth
Task 1 – Start Date: 1 May 2006					
	Work programme start date (Start-up meeting)			23 March 2006	
1 (i)	Agenda of Start Up Meeting with map if necessary/travel information	Agency Project Manager	E-mail	Completed	0
1 (ii)	Minutes of Start Up Meeting	Contractor	E-mail	Completed	
1 (iii)	Set up stakeholder group(s)	Agency Project Manager	n/a	Within 1 month of commencement. Jon Wicks to liaise with the SFRM technical Group to establish a ½ day session	1
1 (iv)	System Design Report	Contractor	E-mail + 2 hard c to PM	Draft by 23 November 2006 Comments returned within 2 weeks Final submitted 23 December 2006	7
1 (v)	Approval of the System Design Report	Agency	Letter	Client approval by 23 January Note: The client manager is to identify an internal (CIS) and external reviewer	9
Upon exercise of Option –Subject to agreed revisions					
Task 2 - Start Date: 1 February 2007					
2 (i)	Developed system ready for testing	Contractor	n/a	Within 12 months of commencement of Task	19
Task 3 – Start Date: 1 October 2007					
3 (i)	Set of software, user guides and testing instructions to testers, plus training and support,	Contractor	n/a	Within 3 month of commencement of Task	22
3 (ii)	Beta testing feedback reports	Others	E-mail	Within 10 months of	30

				commencement of Task	
3 (iii)	Final versions of all software, project and user documentation taking note of testing experience and comments.	Contractor	n/a	Within 2 month of completion of beta tests	33
	Acceptance of all software, project and user documentation	Agency PM/CIS	Letter	Within 1 month of completion of testing and receipt of all software and user documentation	33
Task 4 – Start Date: 1 December 2007					
4 (i)	Dissemination materials; training materials; support arrangements; Roadshow; System support. Technical Summary and Technical Report	Contractor	MDSF website + Agency R&D website	Best timing to be agreed at the end of Task 1	-
For Task 1 and upon exercise of Option for Tasks 2, 3 and 4					
Misc.	Minutes of progress meetings	Contractor	E-mail	Within 10 days of the meeting	
	Progress report (Note: electronic template to be provided by Agency)	Contractor	E-mail	Last week of each month	

6.2 Deliverables

As part of the proposed project the following deliverables will be provided:

From Task 1

Interim Reports will be provided for each of Task 1a to 1f.

An overall project report will be produced based on these Interim Reports under Task 1g *System Design*. The Task 1g report will be submitted as follows

- Technical Summary – draft following within two weeks by a Final
- Technical Report - detailing the project activities, methods, approaches and software
- User Guidance
- Development and extension of present website www.mdsf.co.uk.

In addition to these main deliverables, the Project Manager (Technical) and the Agency's Project Manager will be provided with quarterly progress reports detailing:

7 Administrative details

7.1 Contract details and overall timescales

Science Area:	FRM (MAR Theme)
Science Project No.	SC050051
Programme Start date	23 May 2006
Project End date (Task 1)	November 2006
Task 1 Duration	7 Months
All Tasks in Main Project	May 2009
(Project finalisation based on findings and approval for Task 2 and then release to Beta testing. The beta testing will be commissioned outside of this proposal)	
Main Project Duration	29 Months
Project Executive	Trevor Linford
Theme / Client manager	Suresh Surendran
Technical / Project Manager	Edward P Evans

Contractor managers

Project Manager – Paul Sayers (HRW)
Deputy Project Manager – Caroline McGahey (HRW)
Technical Advisor – David Ramsbottom (HRW)
Halcrow lead – Jon Wicks
Wallingford Software – Robert Millington

Senior Procurement Officer Aditi Cook
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7.2 Communication and Delivery of Outputs

All outputs for all Tasks are to be submitted in draft form to the Agency for review and comment, prior to approval using the Joint Programme style. E-mail communications are acceptable during the contract period but the contractor is responsible for ensuring that the Agency receives these in a timely manner, noting that the external gateway used for Agency e-mails is not 100% reliable. Except for progress reports, final versions of outputs are to be submitted in hard copy and disc version.

All reports will be produced in accordance with Agency style guides, agreed at the project start-up meeting. Reports will be submitted in electronic form in MS Word format. The contractor will ensure that the Agency can retrieve all documents from the files including tables, charts and any graphics. Ideally all of the report will be contained as a single file, less than 2Mb. Large file sizes (>5Mb) should be avoided.

All outputs will be made available by the Environment Agency.

The contractor will maintain close liaison with the Project Manager (Technical) and the Theme / Client Manager.

The MDSF2 team will have regular meetings with CIS as required.

The contractor is required to operate under an appropriate quality management system or be heading towards achieving such a system; e.g. conforming to the requirements of BSEN 9001 (1994), or similar.

A Project Board will be set up to act as the technical quality review panel for the work and outputs. Outputs may be subject to external peer review. The Project Board will review all draft reports produced by the contractor, prior to acceptance. The contractor will ensure that sufficient time is allowed within the project to consult with the Project Board in directing the project. Approximately 4 weeks is likely to be required for the Board to review a final draft document.

There is also a need for the team to interact with 'hands-on' users of MDSF. This should include consultants and EA counterpart Project Managers. A half-day session will be arranged via the SFRM Technical Board. Carl Green, who contributed to the MDSF2 Inception Stage, will also be invited..

7.2.1 Project Board

The Project Board members are

- Trevor Linford (Technical Manager – Flood Risk Mapping & Data Management)
- Suresh Surendran (MAR Theme Manager)
- Edward Evans (MAR Theme Advisor)
- Craig Elliott (Policy Manager - FRM Research & Development)
- Ian Meadowcroft (MAR Theme Champion)
- Vicki Jackson (Senior Scientist, FRS)
- David Murphy (Flood Risk Policy Manager - Strategy, Planning & Risk)
- Mervyn Pettifor (Technical Manager – Strategic Planning & Development Control)

- Stuart Pomeroy (IS Strategy Analyst)

Other Key Technical Advisors / Consultees

- Shirley Greenwood - Policy Advisor (Flood Data, Mapping and Modelling)
- Karl Jeans - FMP Programme Manager (WM Integration & Planning)
- Stephen Worrall - Policy Advisor (SMPs)
- Sue Reed - Process Technical Advisor (CFMPs)
- Paul Wyse - Process Technical Advisor 1 (Flood Data Management)
- Ash Dattani - Chief Architect (Corporate Information Services)
- Tony Burch - Policy Adviser (CFMPs)
- Matt Kean - Process Technical Advisor (Development control)
- Iain Andrews - Process Technical Advisor 1 (Flood Risk Mapping)
- Byron Davies - Technical Architect (CIS)
- Chrissy Mitchell – Theme Manager (SAM)
- Bob Hatton – Theme Manager (IMC)
- Jim Hall – MAR TAG member (University of Newcastle)
- Jeremy Benn - MAR TAG member (JBA Consulting)

The first and only Project Board Meeting will be in Month 6 following deliver of the Draft Technical Report.

8 Publicity

The present MDSF website will be extended to publicise progress on MDSF2 during all Tasks.

Appendices

Appendix 1 Specification

Title: Development of a Decision Support system for a risk-based approach to catchment, estuary and coastal flood management planning (MDSF2)

Phase 2: Main development phase

SCIENCE REF – Flood Risk Management.

Science Ref/No = SC050051

OVERALL OBJECTIVE

The overall objective of the project is to extend and improve the existing, first version of MDSF to incorporate new and improved methods in order to provide a better and more consistent decision support tool for both the CFMP and SMP programmes, strategies and scheme appraisal.

The Modelling and Decision Support Framework (MDSF) was developed in 2001 to provide a tool for quantifying economic and social impacts of flooding at catchment scale for present day conditions, future scenarios and with flood management options.

It has been applied widely for flood/erosion risk assessment as part of the Catchment Flood Management Plan (CFMP) and Shoreline Management Plan (SMP) programmes and has also been used on strategy studies and schemes.

However, the present version of MDSF uses only a simplified representation of the role of defences and does not properly take account of defence performance in the analysis of risks and their management. This is a particularly crucial point in the context of the developing emphasis on flood defence asset management, and for assessing coastal and estuarial risk. MDSF2 will incorporate the RASP (Risk Assessment for Strategic Planning) approach that has been developed to take into account the performance of flood defences. The project will also address a number of software issues such as GIS platform which have been obstacles to widespread uptake within the Agency and will extend its scope to include of portfolios of responses as envisaged by the Foresight Future Flooding project and Making Space for Water.

The benefits will be better and more consistent risk assessment and management over catchments, estuaries and coasts, and more efficient processing of CFMPs and SMPs.

The project will be carried out with a view to developing links with spatial modelling tools being considered for River Basin Management Planning under the Water Framework Directive.

Full details are contained in documents submitted to the PAB and FSoD delegated approval by the Chairman and Chief Executive.

SPECIFIC OBJECTIVES

To improve the present version of MDSF by incorporating the RASP methodology to allow MDSF to assess defences better and thus support a full range of catchment, estuary and coastal planning and option appraisal tasks from high level planning via strategies down to individual defence systems in an efficient, consistent and transparent way.

To do this by building on the present MDFS and the work of the RASP Intermediate Level Method (ILM) and High Level Method (HLM+) to produce a fully tested item of software under an approved QA system which can be efficiently used by operating authorities and their consultants.

To put in links to other strategic systems and projects such as NFCDD, Flood Mapping Programme and PAMS, and to consider future links to similar systems in land and water quality.

To facilitate the inclusion in option appraisal of non-structural options such as rural and urban land management, flood event management and flood loss management thus laying a foundation for a tool which can support the Agency's policy of integrated flood risk management.

To ensure that software development is 'future-proofed' by reducing to a realistic minimum its dependence on specific third party software; and to ensure that the software is modular, so that individual modules of MDSF3 can be re-used in other applications in the RASP family and vice versa.

TARGET AUDIENCE

The target audience is Agency staff concerned with CFMPs, SMPs, strategy and scheme studies, development planning and control; consultants engaged upon these tasks on behalf of the Agency; Local Planning Authorities working with the Agency on development planning; maritime Local Authorities and their consultants concerned with coastal management planning and studies; those responsible for the Making Space for Water implementation; devolved administrations in Wales, Scotland and Northern Ireland

PROGRAMME OF WORK

Main Tasks

Phase 2 of the MDSF2 project will consist of developing a new version of the MDSF (known as MDSF2) that includes the items listed in Table 5.3 of the Phase 1 Inception Report dated June 2005. These are the options approved by the Project Board at their meeting on 19 May, and are summarised below:

- Implementation of RASP methodology.
- Change in GIS platform to make the system as independent as practical.
- Comply with Environment Agency systems and facilitate Agency ownership of the MDSF2 code.
- Improve and extend appraisal facilities both to improve outputs for economic appraisal and provide additional information for the appraisal of social impacts.
- Project management, testing and interim dissemination.

Issues to consider in Phase 2 include the following:

- Decision on modelling approach.
- Development of functional design.
- Liaison with the Environment Agency on integrating MDSF2 into the Agency's IT environment.
- Broader liaison with stakeholders, particularly with regard to items that are not fully defined at present.
- Implementation.
- Testing.

With regard to dissemination and uptake, the following approach is proposed based on the successful support provided to MDSF during 2004 and 2005:

- Prepare dissemination materials for presentation purposes. The materials should clearly demonstrate what MDSF2 does and how it fits with the Agency's procedures for CFMPs, SMPs, Strategy Plans and other Flood Risk Assessments.
- Prepare training materials and apply them internally by non-MDSF staff to ensure that they are suitable for use by potential users.
- Establish dissemination and uptake arrangements similar to the current arrangements for the MDSF. This should be set up before the dissemination process begins to ensure that potential users have immediate support for dealing with queries.
- Undertake a roadshow to each Environment Agency Region to present MDSF2 to both Agency and Consultant staff.
- Support the use of MDSF2 by individual users, including 'hands-on' training.

The specific tasks are discussed below in further detail.

Task 1 – System Design

This will involve: Decision on modelling approach; Review of IT issues including liaison with EA; Development of RASP methodology; Liaison with EA and others regarding items not fully defined at present; Functional design; detailed plans for the remaining tasks, particularly testing and dissemination.

The Task may include early elements of system development as shown in Figure 6.1 of the Inception Report. These may be carried out in parallel with the system design in order to speed up final delivery. In this context the tenderer shall state clearly what will be done and when in his proposed programme for the project.

In doing this Task the contractor must obtain details of all Agency CIS standards, testing and acceptance documentation. The contractor shall develop his system design in line with these and shall consult with CIS in doing this. He shall provide any necessary information to assist CIS in finalising their Technical Assessment for the project. He shall agree with CIS any exceptions to their standards and procedures and shall supply information to assist CIS in the preparation of any documents required to obtain Exceptions approvals in accordance with CIS procedures.

The task will also include agreeing with CIS the exact procedure and criteria for testing and acceptance.

A System Design Report including all the above will be produced and submitted to the Agency at the conclusion of this Task.

Task 2 – System Development

This will involve: Set up Quality System; Software development - GIS platform changes, MDSF1 methods on new platform, Implement RASP methodology, Improved appraisal functionality.

The task will commence on receipt of approval of the System Design Report, and receipt of any Exceptions approvals from CIS. The end-deliverable will be the software ready for Task 3.

Task 3 – Testing, documentation and handover

This will involve: Alpha testing; Beta testing; User Guide.

Alpha testing will be carried out in-house by contractor's staff not engaged on the project, and should be included in the tender price. Beta testing will be carried out by others but the tender shall include for issuing software, user guides and testing instructions to testers, providing training and support, taking note of their experience and comments and finalising the code and documentation in the light of these. The number and type of tests will be agreed with the Agency in Task 1, but as a guide for pricing the tender shall allow for supporting 3 beta test projects.

The tender price shall include for drafting and finalisation of all project and user documentation, and the supply of all information and documents required by CIS to give their final acceptance of the outputs.

This task will be completed upon acceptance of the software and supporting documentation in accordance with Agency procedures as agreed in Task 1.

Task 4 – Dissemination and uptake

This will involve: Dissemination materials; Prepare training materials; Establish support arrangements; Roadshow; System support (including training); development and extension of present website www.mdsf.co.uk.

The deliverables shall include the normal Technical Summary and Technical Report to Agency formats, as well as the material particular to software and its use listed above. The former will be available through the Agency's R&D website as well as through the MDSF website. The Agency will put a link to the MDSF website on their R&D website.

The tender shall include an indicative price for one years initial support, to commence upon acceptance of the software and supporting documentation in Task 3, but this will not be included in the present contract. Prices for other sub-tasks will be firm.

Undertaking the work

There will be a break point in the contract on the conclusion of Task 1 and submission of the System Design Report. At this point, the Agency will review and consider the system design, and will give its approval and/or comments within a period not exceeding one month. Subject to the scope of the comments the Agency may request the contractor to submit revised costings for any agreed changes to the remaining tasks.

The contract will be supervised by an external Project Manager (Technical), in conjunction with an in-house Project Manager who will be responsible for internal liaison matters. All contract orders and instructions will be transmitted to the contractor by or on behalf of the Agency Project Manager.

The contractor shall allow adequate time for consultation with Agency and other stakeholders and consultees.

The contractor should also allow enough time and costs for Project Board meetings and regular progress meetings. As a minimum these should include those for project start-up, quarterly task progress meetings and project closure.

The Project Manager will facilitate all meetings, interviews, any final presentation and data searches at Agency offices. Meetings are to be half days (i.e. 4 hours) and held in a suitable Agency office wherever possible or at the contractor's offices.

Skills sets required

The contractor shall provide a set of skills appropriate to the tasks specified

OUTPUTS & DELIVERY DATES

Table 6.1 shows indicative delivery dates, which shall be confirmed or amended in the tender.

Unless stated otherwise, the output should be emailed to the Project Manager (Technical) and the Agency's Project Manager in a pre-specified format or sent as a CD-ROM if the file size exceeds 5Mbyte. Unless specifically asked for, paper copies should be printed double-sided.

Table 6.1 Indicative delivery dates

Task No.	Deliverable	Responsible party	No. of copies	Date of completion, end:	Proj mth
Task 1 – Start Date: 1 May 2006					
	Work programme start date (Start-up meeting)			23 March 2006	
1 (i)	Agenda of Start Up Meeting with map if necessary/travel information	Agency Project Manager	E-mail	Completed	0
1 (ii)	Minutes of Start Up Meeting	Contractor	E-mail	Completed	
1 (iii)	Set up stakeholder group(s)	Agency Project Manager	n/a	Within 1 month of commencement. Jon Wicks to liaise with the SFRM technical Group to establish a ½ day session	1
1 (iv)	System Design Report	Contractor	E-mail + 2 hard c to PM	Draft by 23 November 2006 Comments returned within 2 weeks Final submitted 23 December 2006	7
1 (v)	Approval of the System	Agency	Letter	Client approval by 23	9

	Design Report			January	
				Note: The client manager is to identify an internal (CIS) and external reviewer	
Upon exercise of Option –Subject to agreed revisions					
Task 2 - Start Date: 1 February 2007					
2 (i)	Developed system ready for testing	Contractor	n/a	Within 12 months of commencement of Task	19
Task 3 – Start Date: 1 October 2007					
3 (i)	Set of software, user guides and testing instructions to testers, plus training and support,	Contractor	n/a	Within 3 month of commencement of Task	22
3 (ii)	Beta testing feedback reports	Others	E-mail	Within 10 months of commencement of Task	30
3 (iii)	Final versions of all software, project and user documentation taking note of testing experience and comments.	Contractor	n/a	Within 2 month of completion of beta tests	33
	Acceptance of all software, project and user documentation	Agency PM/CIS	Letter	Within 1 month of completion of testing and receipt of all software and user documentation	33
Task 4 – Start Date: 1 December 2007					
4 (i)	Dissemination materials; training materials; support arrangements; Roadshow; System support. Technical Summary and Technical Report	Contractor	MDSF website + Agency R&D website	Best timing to be agreed at the end of Task 1	-
For Task 1 and upon exercise of Option for Tasks 2, 3 and 4					
Misc.	Minutes of progress meetings	Contractor	E-mail	Within 10 days of the meeting	
	Progress report (Note: electronic template to be provided by Agency)	Contractor	E-mail	Last week of each month	

DELIVERABLES

The outputs are intended for use by Agency staff concerned with CFMPs, SMPs, strategy and scheme studies, development planning and control; consultants engaged upon these tasks on behalf of the Agency; Local Planning Authorities working with the Agency on development planning; maritime local authorities and their consultants concerned with coastal management planning and studies; those responsible for the Making Space for Water implementation; devolved administrations in Wales, Scotland and Northern Ireland

During the course of the project, the contractor will provide the Project Manager (Technical) and the Agency's Project Manager with quarterly progress reports detailing:

progress against programme and difficulties encountered with the project
any proposed changes to the manner in which the project is run or the programme
time spent on the project
details of the financial spend/invoices during the previous quarter.

To disseminate this research more widely it may be appropriate to develop a number
journal papers and/or conference presentations/posters. Preparation of such articles will
be subject to review and/or co-authorship by the Agency.

ADMINISTRATIVE DETAILS

Contact details and timescales

Science Area:	Flood Risk Management
Science Project No.	SC050051
Project Start date	February 2006
Project End date	January 2008 (following the delivery and acceptance by the Agency of all the deliverables listed in Table 6.1)

Project Duration	24 Months
Science Project Manager	EP Evans, Project Manager (Technical), Suresh Surendran (Environment Agency)

Senior Procurement Officer	Urmila Bhatti Environment Agency, Block 1 – Government Buildings, Burghill Road, Westbury-on-Trym, Bristol, BS10 6BF Tel: 0117 914 2676 E-mail: urmila.bhatti@environment-agency.gov.uk
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Communication & Delivery of Outputs

All outputs are to be submitted in draft form to the Agency for review and comment, prior to approval. E-mail communications are acceptable during the contract period but the contractor is responsible for ensuring that the Agency receives these in a timely manner, noting that the external gateway used for Agency e-mails is not 100% reliable. Except for progress reports, final versions of outputs are to be submitted in hard copy and disc version.

All reports must be produced in accordance with Agency style guides, agreed at the project start-up. Reports should be submitted in electronic form in MS Word format. The contractor will ensure that the Agency can retrieve all documents from the files including tables, charts and any graphics. Ideally all of the report shall be contained as a single file, less than 2Mb. Large file sizes (>5Mb) should be avoided.

All outputs will be made available by the Environment Agency.

The contractor is required to maintain close liaison with the Project Manager (Technical) and the Agency's Project Manager.

The contractor is required to operate under an appropriate quality management system or be heading towards achieving such a system; e.g. conforming to the requirements of BSEN 9001 (1994), or similar.

A Project Board will be set up to act as the technical quality review panel for the work and outputs. Outputs may be subject to external peer review. The Project Board will review all draft reports produced by the contractor, prior to acceptance. The tenderer should ensure that sufficient time is allowed within the project to consult with the Project Board in directing the project. Approximately 4 weeks is likely to be required for the Board to review a final draft document.

Project Board

The contractor will be notified of Project Board members and roles at the start-up meeting

PUBLICITY

The contractor shall extend the present MDSF website and use it to publicise progress on MDSF2.

ADDITIONAL INFORMATION

Continuity of Personnel

The Contractor shall employ sufficient staff to ensure that the Services are provided at all times and in all respects to the Project Standard. It shall be the duty of the Contractor to ensure that a sufficient reserve of staff is available to ensure project delivery in the event of staff holidays, sickness or voluntary absence.

The Agency will be notified immediately of any changes to personnel associated with the project. The Contractor will ensure that every effort is made to replace outgoing staff with personnel of equal calibre and expertise. All new members of staff undertaking work for the Project will need to be agreed by the Project Manager prior to commencement.

At all times, the Contractor shall only employ in the execution and superintendence of the Contract persons who are suitable and appropriately skilled and experienced.

Intellectual Property Rights

All Results shall be the property of the Agency.

Quality Assurance

Please enclose a brief overview of your quality management systems with your tender, you should include descriptions of what works well and areas requiring improvement, and any actions you have taken as a result of client feedback (½ page of A4).

Within 28 days of appointment, the contractor will agree with the Agency the quality assurance procedures to be used throughout the project. The contractor will modify the project quality assurance procedure as necessary following the appointment of any sub-consultant or other consultant employed directly by the Agency. Details of the proposed modifications shall be submitted to the Agency within 28 days for agreement.

CVs

Please provide CVs of all proposed members of staff, including sub-contractors. CVs to be no longer than 6 sides of A4. Please ensure that all details provided are recent and relevant.

Methodologies

Please provide details of the methodologies you propose to undertake for the various tasks included in this tender document. Please include details of your capability and capacity to undertake the Project.

References

The Agency may request recent and relevant references prior to the award of the Project.

Alternative Offers/ Optional Extras

Alternative offers will be considered if they constitute a fully priced alternative and are submitted in addition to a tender complying with the requirements of the tender Documents. The Agency is under no obligation to accept the alternative proposals or any optional extras.

REFERENCES

Any documents referred to in this document must be fully referenced.

e.g. Environment Agency (2002a) Investigation of the composition and emissions of trace components in landfill gas. R&D Technical Report P1-438/TR. Environment Agency, Bristol.

ENVIRONMENTAL CONSIDERATIONS

The Environment Agency is committed to continually improving its environmental performance. It has set itself tough objectives as a clear commitment and contribution to sustainable development throughout England and Wales. The Agency recognises that this can only be achieved through commitment from all sectors of society and it is intent on raising awareness amongst industry and commerce.

Contractors must adopt a sound proactive environmental approach, designed to minimise harm to the environment.

Environmental criteria should be considered as part of your tender submission with credit given for innovation. Factors to be considered could include areas such as:

- Paper use: All documents and reports prepared by consultants and contractors are produced wherever possible on recycled paper containing at least 100% post consumer waste and printed double sided.
- Travel: use of public transport, reduce face to face meetings by using email and videoconferencing. Meetings to be held in locations to minimise travel and close to public transport links.
- Packaging: should be kept to a minimum. Re-use and disposal issues must be considered.
- Efficient Energy and Water Use.

- Disposal of Waste: Whilst on site the contractor is responsible for the disposal of their own waste and can only use Environment Agency facilities with express permission from the on site facilities officer.
- Whilst on site, contractors should comply with the local environmental policy statement which will be made available to you in advance or on arrival.

DATA PROTECTION ACT ADDENDUM TO SPECIFICATION

Protection of Personal Data

In order to comply with the Data Protection Act 1998 the contractor must agree to the following:

- You must only process the personal data in strict accordance with instructions from the Environment Agency.
- You must ensure that all the personal data that we disclose to you or you collect on our behalf under this agreement are kept confidential.
- You must take reasonable steps to ensure the reliability of employees who have access to personal data.
- Only employees who may be required to assist in meeting the obligations under this agreement may have access to the personal data.
- Any disclosure of personal data must be made in confidence and extend only so far as that which is specifically necessary for the purposes of this agreement.
- You must ensure that there are appropriate security measures in place to safeguard against any unauthorised access or unlawful processing or accidental loss, destruction or damage or disclosure of the personal data.
- On termination of this agreement, for whatever reason, the personal data must be returned to us promptly and safely, together with all copies in your possession or control.

TENDER SUBMISSION

Tender submission must include the following:

- a. Completed Pricing Schedule
- b. Completed Environmental Questionnaire
- c. Completed Health & Safety Questionnaire
- d. Please complete Appendix to Conditions and the Schedule of Prior Rights (if applicable)
- e. CVs of proposed members of team (See 9.4 above)
- f. Copy of your Quality Assurance process (please provide copies of any accreditation(s)) (See 9.3 above)
- g. Gantt Chart of proposed timescales
- h. Please provide details of how you propose to maintain continuity of personnel (See 9.1 above)

Please note, information requested must be provided. Incomplete tender submission may be discounted.

Clarification on technical issues of the tender pack should be directed to the Project Manager (Technical).

Clarification on the tender process can be sought by contacting the Senior Procurement Officer.

The Agency also requests that you highlight any conflicts of interest you may have if your were to be awarded this contract.