Issues raised during the NGA Road Shows

Introduction

At the introduction of each Road Show the undertaking, to record all the issues and concerns without comments and/or prejudice, was made. The list below contains all the issues and concerns as they were recorded (see column 'Problem Statement'). An attempt was made to categorise them in order to give a coherent response. The responses are recorded under the column 'Solutions' and where additional actions where required the column 'Action' contains a 'Yes' and the required actions are recorded under column 'Comments'.

There are about 200 issues and concerns which have been divided into 14 categories. The categories are shown in Table 1

Table 1: Issues and Concerns as raised by attendees

No	Issue Category	Number of Issues	Page Number
1	Access to data		2
2	Data related issues		4
3	Open-NGDB System	14	11
4	National Groundwater Archive (NGA) System	79	14
5	Department Water Affairs and Forestry (DWAF) Databases and Integration	5	24
6	Water Management System (WMS)	8	25
7	Hydstra	12	27
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9	Data Acquisition	12	30
10	Data Quality	3	32
11	Borehole Numbering/Site IDs	6	33
12	Borehole Drilling Information	18	34
13	Water Use Authorisation	1	38
14	General	4	39

No	Problem statement	Solution	Action	Comments
1. ACCESS				
1.1	There is no access to the Open-NGDB the system is used only internally by DWAF staff	NGA is web-based thus universally available	No	
1.2	What checks are on the system in terms of ownership of data	A field relating to ownership has been built in but its implementation needs clarification. Ownership addressed through NGA security system as well	Yes	Data Management Agreement (DMA) must be completed and signed-off at the NEXT NGIS steering Committee
1.3	Can there be some pre-registration checks including training	Training and registration could/should potentially be linked but still needs discussion and clarification	Yes	A framework for training to be produced – the following suggestions were made i) all users will be registered as enquirers, ii) training will be for two days with day 1 a NGA-demonstration and day 2 practical data capturing (attendees to bring their own data)
1.4	Concept of 'trustees'	Relates to ownership and needs clarification see 1.2	No	Concept of 'Trustee' not accepted as each organization will be capturing its own data

No	Problem statement	Solution	Action	Comments
1.5	There need to be an improved communication between DWAF and Stakeholders	A communication Strategy need to be developed	Yes	The following internal communication mechanisms already exists: - i) Continuous communication via Operation User Group meetings; ii) Implementation of operating procedures and standards (i.e. DMA) needs to be done; ii) Global list for all users to be contacted when there is a need, will be created; iv) Links to the GWD must be established and maintained

2. **DATA**				
No	**Problem statement**	**Solution**	**Action**	**Comments**
2.1	Data is unreliable and/or lack of accuracy	This aspects is largely outside the scope of the data capturers and the application/enforcement of the Standard Geosite Descriptors should be discussed	Yes	Standard Geosite Descriptors (SGD) will be reviewed NGA User Manual will be developed Regularly address the training of the data suppliers Improve Data Capturers training scope to include basic groundwater principles Establish and maintain formal Data Assurance procedures and processes
2.2	Data can not be imported/ Requirements for uploading data is too complicated	Development of a 'bulk upload facility' is scheduled for late next year Other applications need to conform to NGA	Yes	Development already scheduled
2.3	Structure layout of data on the spreadsheet is a problem, it's not usable	Should adaptations be necessary it will be discussed Data format to be dealt with when the export functionality is sorted	No	
2.4	Too many codes used when extracting data	Totally abolished in NGA	No	

No	Problem statement	Solution	Action	Comments
2.5	There is no live data (data need to be updated at all times)/ Data must be accurate and updated	Data owners will be able to update their own data	Yes	DMA will clearly reflect the responsibility of all data owners to keep their data up to date Also see 2.1
2.6	Springs data is not properly addressed	Standard geosite descriptors will assist in classifying the springs	Yes	Devise a training programme for SGD
2.7	Data can not be audited automatically or manually	Business Rules has been built in	No	
2.8	Geophysics information is not available	Availability of 'Downhole geophysics' shown	Yes	A link will be formed for future development between NGA and Geophysics reports database, where reports with geophysics data can be opened and viewed
2.9	Pollution sources not identified	No development for this in NGA, however, it will be investigated in future	Yes	Keep track of this request when the development of GIS-front-end User Requirement Definitions (URD) is launched
2.10	Data is not publicly accessible	In NGA data will be web-based and will be viewed by everyone	No	
2.11	Data attribute need to link with excel	See 2.3	No	
2.12	Geological logs must be available together with borehole information	See 2.3	No	
2.13	Maps showing borehole position must be included	GIS Front-end included in planning schedule	Yes	Discuss at next National Groundwater Information System (NGIS) Steering Committee meeting

No	Problem statement	Solution	Action	Comments
2.14	Standardized methods regarding borehole data must be aligned with the Standard Geosite Descriptors	NGA built primarily on SGD and industry should rather make the adaptations See 2.1	Yes	Standard forms is already available and will be downloadable end run-time in future
2.15	Some data get deleted/ Thorough checking need to be done before deleting on Open-NGDB to avoid unnecessary deletion	Data owner issue (part of the DMA)	Yes	Draw up a monitoring point registration and deletion procedural manual
2.16	Some Boreholes are registered in Open-NGDB but they have no proper borehole information	See 2.15	No	
2.17	If there is no data available default values need not to be used, blank spaces must be left instead	No default values for NGA	No	
2.18	There must be a facility to match data taken as duplicates before deletion is done	Validation radius to avoid duplicates in NGA Data owner responsibility	Yes	Future development of validation for existing data
2.19	There need to be a report showing the data already existing in the system	Reporting functions on NGA very comprehensive Availability and quality Index to be added	Yes	Include 'Data Availability and Quality Index' in future developments

No	Problem statement	Solution	Action	Comments
2.20	There need to be an indication of whether the borehole captured is licensed or registered	Possible link to WARMS	Yes	Initiate system discussions with Keuris & Jack; Initiate business discussions with?
2.21	Requirements for data upload too complicated	Nothing in place yet	Yes	Will discuss with data suppliers
2.22	Improved editing of existing data required	See 2.1	Yes	Quality assurance will start again once the NGA live and stable – procedures need to be revised!
2.23	Accuracy in data positioning is required	See 2.1 (data suppliers)	No	
2.24	Ownership possibly handled through identification and registration of 'trustees'	See 1.2	No	
2.25	Elevation accuracy (for GPS) possibly needs to be changed	Requirements to be visited GPS don't give accuracy for elevation but only for Co-ordinates	Yes	Request the mandatory accuracy requirement to be taken away
2.26	How will changes in collar height affect water levels?	There must be History of the collar heights (Calculation?)	Yes	No requirements for this yet: must be reviewed
2.27	How does DWAF ensure that the lithology information provided in the drillers report is correct?	Review the requirements NGA does not include this for now	Yes	Drillers' lithological descriptions
2.28	Is there a correlation between water quality data and borehole data?	Link data between WMS and NGA in process	Yes	Launch full linking project once NGA is live and stable

No	Problem statement	Solution	Action	Comments
2.29	There is less new data on the Open-OPEN-NGDB	Data Management responsibility	Yes	Ensure this aspect is adequately addressed in the DMA
2.30	There is co-ordinates inaccuracy with spatial and borehole data	Data Management responsibility	Yes	Ensure this aspect is adequately addressed in the DMA
2.31	Reference datum used in getting data not clear	Stakeholder request/ export See 2.3	No	
2.32	Is there a link between borehole data from DWAF and borehole data from private individuals	See 1.2	No	
2.33	There are duplicates on the Open-NGDB	Groundwater Resource Information Project (GRIP) verification process takes care of a lot of duplicates NGA procedures to be developed	Yes	NGA project to eliminate duplicates will be initiated
2.34	Who owns all the data that is on the Open-NGDB	DWAF only custodian	No	
2.35	A query facility need to be included to be able to select GPS accuracy if file is not known	See 2.23	No	

No	Problem statement	Solution	Action	Comments
2.36	How do you know if the data is up to date	Data owners responsibility	Yes	There will be a transaction report on NGA to show the updates in future
2.37	What is the strategy used in populating these databases(Open-NGDB/NGA)	Mechanisms to ensure capturing and to control the production of data must be devised	Yes	Each region must have its own Groundwater Master Plan (taken from National Office (NO) framework) Data Management Agreement will be signed The controlling mechanism will be the borehole numbering system
2.38	Does DWAF have data capturers to capture borehole data	Yes, we do at the National Office (NO), some Region Offices (RO) they don't, in such cases NO assist	No	
2.39	Spatial distribution of data is funny (accuracy 4)	No accuracy 4 on the NGA NGA allows you to extract only the site that you want (i.e. advance search) In NGA you have an option i.e. interpolated from a map or GPS	No	
2.40	Some sites have incomplete data and this results in data not being useful	Advance search will help to eliminate such sites RO responsibility to ensure only complete data captured from now on	Yes	NO will go through the records to see if we can capture more (already indicated on Open-NGDB Exit Report as a project)

No	Problem statement	Solution	Action	Comments
2.41	HYDROCOM data is not on the Open-NGDB	All HYDROCOM data is on Open-NGDB, dated as from 02/01/00	No	
2.42	Some borehole data is not getting into the Open-NGDB	Data Management issue See 2.37 If data is not submitted to us, there is nothing we can do	Yes	A mechanism will be formulated to report to the Regions, if their data has been captured successfully
2.43	Some boreholes registered in the Open-NGDB does not exist in the field	This is due to: - i) Inaccurate co-ordinates provided by data suppliers from the field; ii) Errors that occurred during encoding & capturing; iii) Extremely old records e.g. dated back to 1906; iv) Wrong reference datum used; v) Primary data as a source of data control is lacking; vi) It is important for data capturers to work accurately	Yes	Provide continuous training and extend training to professionals
2.44	Hydrological data is not properly presented on the Open-NGDB	NGA has more comprehensive fields to report parameters for results analysis	No	
2.45	Geohydrological parameters are incomplete on the Open-NGDB	See 2.40	No	
2.46	A strategy is needed to obtain all available data	See 2.37	No	

No	Problem statement	Solution	Action	Comments
	3. NGDB SYSTEM			
3.1.	Recommended data abstraction rates need to be clearly stated	Operational recommendations exist in NGA	Yes	Recommendations need to be captured from Primary data
3.2	Definition of new fields and new terms need to be explained earlier to the users	Standard Geosite Descriptors (SGD) exist http://www.dwaf.gov.za/Groundwater/documents.asp for this Groundwater Dictionary exist http://www.dwaf.gov.za/Groundwater/glossary.asp	Yes	Promote the existence of both
3.3	DWAF need to provide standards for encoding (Consultants must be able to code and capture comprehensive data sets)	SGD exist National Office (NO) will provide training NO will audit data Standardised form has been developed which is in line with the NGA	Yes	Promote the existence of both
3.4	Confidence in all systems need to be created Avoid unauthorized deletion of data	Data owner has control of all the deletions Data Administrator will have rights to delete	Yes	Provide training

No	Problem statement	Solution	Action	Comments
3.5	Problems are encountered when using the site I.D to access data	No site ID in NGA - any record registered in NGA must have a recognized geosite number	Yes	Get the Geosite Numbering Policy signed
3.6	The system is not user friendly	NGA has been developed to be user friendly	Yes	Develop procedures to test the user friendliness of NGA
3.7	There are repeatable fields in the Open-NGDB	Repeatable fields has been minimized through process of normalisation

In NGA, you select a field that is necessary to capture. | No | |
| 3.8 | Data extraction from the Open-NGDB is limited, difficult and time consuming | NGA is web-based

There is advance search to minimize other selection | No | |
| 3.9 | Borehole numbering system is not visible enough | We envisage to develop a web-based system

The Numbering Systems for all nine Regions are in place and the allocation is currently done manually | Yes | URD & URS already completed – funds necessary to develop the web-based software |
| 3.10 | South African Groundwater Decision Tool (SAGDT) and the NGDB data do not correspond | SAGT supported by GRA II data sets - calculated from Open-NGDB Data | Yes | Develop GIS Front-end to update GRAII data sets regularly (business analyses already completed) |

No	Problem statement	Solution	Action	Comments
3.11	When extracting data from the Open-NGDB Reference datum does not appear	With 'Advance Search' you can do this To be addressed in NGA	No	
3.12	The Open-NGDB is incompatible with the popular interpretation software	A list of such software's to be looked at to see how they can help to develop the NGA	Yes	Work towards a standard data exchange format
3.13	Accuracy codes need explanation	No codes used in NGA, rather full, self explanatory descriptions	No	
3.14	Final blow yield needed as part of data	It has always like that been on the Open-NGDB In NGA it is called 'Total Blow Yield'	No	

		4. NGA		
No	**Problem statement**	**Solution**	**Action**	**Comments**
4.1	Is it going to be an online live system?	Yes, NGA is web-based	No	
4.2	Is water quality data going to be separated from borehole data?	Yes, but there is a project to link this data	Yes	There is a project to link this data
4.3	Does NGA link to other relevant acts e.g. Biodiversity act, RDM actions and RQS actions?	No, the system can't link to an act	No	
4.4	Is there an external interface to NGA?	Yes, the system is web-based	No	
4.5	Is there any interface between Aquabase and NGA?	Not at the moment	Yes	Provide a 'Standard Data Exchange Format'
4.6	Is there any link between groundwater maps and NGA?	No	No	
4.7	If NGA collapses will data owners be able to access their data?	Yes, there are comprehensive back up standards and procedures in place at DWAF & NGA Developers adhere to such standards	No	
4.8	Will NGA link to the improvement of WSDP and SDP (Spatial Developments Plans)?	Not at the moment	Yes	Negotiate with WS to find out we can support each other

No	Problem statement	Solution	Action	Comments
4.9	A person registering as a user for any institution must be verified if he/she is from that institution	Part of the registration process (NGA Data administrator will do the verification)	No	
4.10	After logging into the system, why do you have to choose the data owner again?	To show the location of the record you want to search – one data capturer can work for more than one data owner	Yes	Part of the envisaged training
4.11	Pump test data upload option will take time (loading one by one).	Bulk upload scheduled for next financial year	Yes	Negotiate for 'Standard Data Exchange Format'
4.12	Regional offices are failing to comply with DWAF policy of putting data in similar DWAF systems e.g. NGDB/AQUABASE, how is DWAF going to get consultants to capture data on NGA?	If consultants are doing projects for DWAF, they'll be forced to provide data, but if it's for their own private projects, we can not force them	Yes	Use this 'Issues and Concerns' to develop a policy regarding the use of external/internal databases and/or information systems
4.13	DWAF's interaction with the Consultants is minimal	NGA Road shows is the first communication line	Yes	Develop a 'Communication Strategy'
4.14	Data export functionality to be prepared	Once NGA is live, there first phase for export functionality, that will be developed is static export functionality. The dynamic export functionality will be developed in the second phase.	Yes	Negotiate the format(s) of the static export file(s)
4.15	Can data ownership be transferred?	Yes it can be transferred by the data owner	Yes	Part of the envisaged training

No	Problem statement	Solution	Action	Comments
4.16	Will the registration to use NGA be on the web?	Yes	No	
4.17	Will there be water level data on the NGA?	Only hand measurements and pump test water levels - Time series water levels are in HYDSTRA	Yes	Investigate the possibility to extract water level data directly from Hydstra
4.18	Will the consultants be able to add their employees?	Yes	Yes	Part of the envisaged training
4.19	Photos need to be included with the borehole data to help in identifying a borehole in the field	This will be added up into the stakeholder request	Yes	Log a request in 'Stakeholders' Requests'
4.20	How many people can work with this system?	Unknown, the system has not been stress tested.	Yes	Perform Stress Testing
4.21	Is NGA going to link to HYDSTRA?	Currently there is a static link between the NGA and HYDSTRA Dynamic link will be developed at a later stage	Yes	Investigate the possibility to extract water level data directly from Hydstra (dynamic link)
4.22	Every data owner must have back up for their own data	DWAF has comprehensive back up system (Data Owner's back-up should be in the form of keeping 'Primary Data' in their own archives	No	

No	Problem statement	Solution	Action	Comments
4.23	Quality controls need to be done on all data entering NGA with special emphasis on coordinates and chemistry	Business rules has been implemented on NGA for Geosites Chemistry bulk upload facility exist on WMS Quality control standards are being developed by DWAF for Data Owners to apply Also see 4.22	Yes	Data Management Agreement should reflect the required 'Quality Controls'
4.24	Query mode need to be included to be able to select GPS accuracy if file is not known	There is 'Advance Search' for this type of data extraction	No	
4.25	Is there a time limit on Confidentiality?	Yes, data captured for ongoing projects will be kept as confidential, once the project is complete, the confidentiality on the data will be taken away	Yes	Consider the drawing up of a 'Confidentiality Policy'
4.26	Will the geological logs be included in future?	Yes Also see 2.12	Yes	Structure of the Geological Logs Module to be clarified at next NGIS Steering Committee meeting
4.27	Why would consultants put their data on the internet?	See 4.12	No	
4.28	Will it be possible to release data every six months in a shape file GIS format?	It will depend on the data owners or users	No	

No	Problem statement	Solution	Action	Comments
4.29	The coordinates must correlate with the map number and the district name.	This is included in the Business Rules	No	
4.30	There is a risk that some people will capture data of poor quality	DWAF Data Auditors will audit data	Yes	Data Management Agreement should cover this aspect
4.31	A standard must be drawn in that, only one reference level must be used , so that the system can quickly pick it up if it's a duplicate	As long as the reference datum used is recorded, it can be converted At the appropriate time the switch to only WGS84 will be undertaken	Yes	Discuss the switch to WGS84 at next NGIS Steering Committee meeting
4.32	Is it possible to capture any standard casing for a geosite?	Yes, there is steel and PVC casing	No	
4.33	Is there a link between WARMS and the NGA?	No, but there should be a link	Yes	
4.34	Is there a facility for the capturing of large amount of water quality data?	Yes, bulk upload available in WMS	No	
4.35	Is it possible to have a query mode that can eliminate unimportant information?	Yes, there is an 'Advance Search' function just for this	No	
4.36	Is it possible to transfer data from Excel to the NGA?	Bulk upload scheduled for late next year	No	

No	Problem statement	Solution	Action	Comments
4.37	Will it be possible to add more data on the site already existing?	Yes, maintain Geosite field exist for this a but can only be done by the data owner	No	
4.38	Will it be possible to remove incorrect data?	Yes, data capturers can delete field entries and the data administrator can delete the whole site	No	
4.39	Boreholes with a lot of time series data should be given as separate series data	Time Series data is kept in HYDSTRA	No	
4.40	There must be a user friendly search criteria	'Advance Search' function has been implemented	No	
4.41	Will it be possible to search by using a reference datum?	Yes, there is an 'Advance Search'	No	
4.42	A warranty need to be granted in that data from the Tertiary Institutions will be available for at least 10 years in the NGA (It's the policy for all universities to keep their data for at least 10 years before it is destroyed)	Data will always be available on NGA Data can be kept more than 10 years Only the data owner can delete the data	No	
4.43	Consultants feel that, if they give out their data on the internet, this will lower the competition advantages	There is confidential data in NGA	No	

No	Problem statement	Solution	Action	Comments
4.44	Public sectors are not reluctant to share their data	Comment	No	
4.45	Feedback on data status need to be given to all groundwater divisions	Any enquirer can extract data Any enquirer can see the data status	Yes	Develop a 'Communication Strategy'
4.46	Chat room need to be included in the web, so that information can be shared with everybody using the same groundwater data throughout the world	Good idea, to be discussed with the Water Research Commission	Yes	Log a request on 'Stakeholder Requests'
4.47	The coordinate reference system must be clearly stated	This is mandatory on the NGA	No	
4.48	Will it be acceptable to capture data on NGA without filling the NGA form (Some people have lots of data on paper but no forms)?	The system is designed in such that there is no need for a form The NGA form exist on the Groundwater website for quality control purposes http://www.dwaf.gov.za/Groundwater/forms.asp	No	
4.49	Will the NGA require casing depth and diameter for water level upload as it was in the Open-NGDB?	No it is not necessary in the NGA	No	

No	Problem statement	Solution	Action	Comments
4.50	There need to be a choice for a quick add or a long add for borehole information	Mandatory data = quicker Optional data = longer	No	
4.51	Is it possible to extract reports from NGA?	Still to be developed, but not for the first release	Yes	Static Report's formats still to be discussed
4.52	If you are adding same data information using different ID, will the system be able to pick that up?	Yes, duplications can be picked up by checking the identifiers and checking the coordinates.	No	
4.53	Is water level data going to be kept in NGA or in Hydstra?	See 4.17	No	
4.54	Will it be possible to capture spring data on NGA?	Yes, see Standard Geosite Descriptors (SGD) for spring classification.	Yes	Investigate a SGD Training Course
4.55	Will there be any link between borehole data and spatial data?	Future developments, once there is a GIS front-end	No	
4.56	How is it going to be ensured that whoever is putting data in the NGA is a reliable source?	Data Management Agreement will be signed.	No	
4.57	There must be incentives for those who will submit borehole data	Nothing for the time being	Yes	Discuss an 'Incentive Scheme'
4.58	Will DWAF audit data and notify the data owner if it needs to be improved?	Yes	No	

No	Problem statement	Solution	Action	Comments
4.59	Will DWAF provide back up if data get lost or damaged?	Yes	No	
4.60	Does NGA comply with the National Water Act?	Yes	No	
4.61	Hydrogeological brochures must be used as primary data sets	Brochures contain information and no data	No	
4.62	There must be a confidence level of all attributes	The whole Geosite record can be marked as 'Quality Assured' but not at attribute level	No	
4.63	Data Ownership must be revised	Current 'Data Owner' mechanisms are very versatile, after a year its success will be evaluated.	Yes	Keep an eye on the success on 'Data Ownership' concept
4.64	Roles and Responsibility of a custodian must be clearly stated	DMA	Yes	Ensure that this aspect is adequately addressed
4.65	There must be a policy of who is allowed to capture	DMA will serve as a policy for access control mechanism	Yes	Ensure that this aspect is adequately addressed
4.66	Measuring methods for Discharge rates must be specified	This is implemented in NGA	No	
4.67	Monitoring facility conduit for dip meter	This is specified in Minimum Standards and Guidelines for groundwater development project which is published in Groundwater web page under Documents	Yes	Re-assess the updating of MSG document

No	Problem statement	Solution	Action	Comments
4.68	Water levels with specific status must be extracted	'Advance Search' has such an option User Test Case still to be prepared This will be highlighted in the Introduction for NGA	Yes	Ensure it is highlighted in NGA Introduction
4.69	Discharge rate units at extraction time must be displayed	Units are displayed in NGA (there are 4 different types to choose from	No	
4..70	There must be a functionality of customizing and saving queries	Requirement for export functionality to be addressed	Yes	Log in 'Stakeholder Request'
4.71	Heights / Elevations must be clearly explained and discussed in details	This is included in the SGD Groundwater Dictionary to assist	Yes	Check G/water dictionary and update if necessary
4.72	There must be a Bulk water meter protocol linking volume to meter	Business Rule built in NGA	Yes	It need to be properly explained in the training manual
4.73	Water quality classes must be specified	Classification System used must be in NGA	Yes	Check with Phillip Kempster from RQS to review 'Water Quality Classes' standards
4.74	Sampling time and depth must be captured	This is implemented in NGA and it's called field measurement module	No	
4.75	Drawdown must be clearly defined	This is included in the SGD Groundwater Dictionary to assist	Yes	Check Groundwater dictionary and update if necessary

No	Problem statement	Solution	Action	Comments
4.76	Pump type and power source must be stated under the operational recommendations field	This is implemented in NGA Pump must be recommended but not the power source	No	
4.77	Correct definition to be identified between the final blow yield and the Total blow yield.	They are the same, but the groundwater dictionary will be checked to ensure this	Yes	Check Groundwater dictionary and update if necessary
4.78	Is it going to be easy for anyone to build their own interfaces with NGA	Yes as long as a standard data exchange standard exists	Yes	Negotiate for 'Standard Data Exchange Format'
4.79	How is it going to be ensured that data is not misused by other system users?	DMA	Yes	Ensure that this aspect is adequately addressed

No	Problem statement	Solution	Action	Comments
**5. DWAF DATABASES, SYSTEM INTEGRATION**
5.1	Why so many systems? DWAF need to create a master system that will link all the systems (i.e. WARM,WMS, HYDSTRA, etc)	DWAF is working towards the integration of the systems It's impossible to create one system, an interface between all systems is possible This is the responsibility for Directorate: Information Programmes	No	
5.2	There are many systems used by DWAF some of which their use is not understood, thus causing confusion to the stakeholders	Regional visits on the promotion of such systems will be conducted e.g. Road shows	Yes	Discuss the formats of future Regional visits
5.3	A project to link all DWAF systems need to be of high priority	See 5.1	No	
5.4	There need to be a close co-operation between the Open-NGDB and WARMS	Need to be investigated	Yes	Discuss system integration with Herman Keuris and Luluma Jack
5.5	Matching data from different databases is very difficult (Identifiers used in WMS are not used for the Open-NGDB)	Linking project to be of high priority once NGA is live	Yes	Log as 'High Priority' in NGDB Exit Report

		6. **WMS**			
No	**Problem statement**	**Solution**	**Action**	**Comments**	
6.1	Will the water chemistry data be included in the NGA?	See 5.5	Yes	A matter for future Regional visits	
6.2	In WMS there is no space for organics contaminants and microbial contaminants only isotopes are of concern, why?	There are procedures in place in WMS to register new variables	Yes	Elna Vermaak to be contacted if the need arise	
6.3	External water quality data must go to WMS, if it's for monitoring purposes	The bulk upload facility already exist	Yes	Mention in NGA Introduction	
6.4	There is lack of communication from Roodeplaat	It will be improved	Yes	As Elna Vermaak is the contact person she must be included in the 'Communications Strategy'	
6.5	Accredited laboratories must be involved in WMS issues	RQS is accredited	No	As Elna Vermaak is the contact person she must be included in the 'Communications Strategy'	
6.6	There must be a facility to upload water quality data from external sources to other systems other than WMS.	Same as 6.3	Yes	Mention in NGA Introduction	
6.7	There need to be an improvement in Water Quality Monitoring	This is a Business problem not a System problem		This is better addressed in Groundwater Master Plan

Elna to engage in Road Shows to promote WMS? | |

No	Problem statement	Solution	Action	Comments
6.8	Where is water quality data from data loggers stored?	Nowhere at the moment	Yes	To identify role players and start discussions

No	Problem statement	Solution	Action	Comments
		7. HYDSTRA		
7.1	Monitoring points on Hydstra get deleted on the Open-NGDB	In NGA roles and responsibility allow special /certain persons to delete sites DMA	Yes	Procedural manual to be created for the registration and deletion of monitoring points
7.2	There are old water levels existing on the Open-NGDB and not on Hydstra	Check and remove all time series water levels from NGA	Yes	This difference must be explained in the Introduction to NGA document Log request in Open-NGDB Exit Report
7.3	Any record with more than one water levels must go to Hydstra	Definition of what the monitoring point is will give an answer	Yes	Develop a definition of what the monitoring point
7.4	Is NGA going to link to HYDSTRA?	Future development	Yes	Log request in 'Stakeholder Requests'
7.5	Is National Water level monitoring data go straight to Hydstra?	Yes, when it is submitted (DMA to address this issue)	Yes	Ensure adequately addressed in DMA
7.6	Frequency of water level measurements for monitoring purposes must be clearly stated	See 7.3	Yes	Eddie van Wyk to ensure that 'Monitoring Strategy' adequately address this issue
7.7	Water level data must distinguish between rest levels and pump levels.	It does on NGA	No	

No	Problem statement	Solution	Action	Comments
7.8	Frequency of water level measurements must be dense enough to recognize recharge events.	See 7.3	Yes	Eddie van Wyk to ensure that 'Monitoring Strategy' adequately address this issue
7.9	There must be an indication of whether water level pressure is corrected or not	In NGA and HYDSTRA, it will be investigated on how this can be incorporated	Yes	Log in 'Stakeholder Request

Emiel Holemans must also be approached for Hydstra purposes |
| 7.10 | Calibrated data is critical when doing regional studies; absolute water level heights are needed. | NGA provide elevations, water levels and collar heights, when extracting data you've got a choice to choose between these three | No | |
| 7.11 | There used to be forms for capturing water level data, they were used previously, what happened to them? It seems like they just disappeared | There were never forms, this need further clarification | Yes | Investigate the usability of such forms |
| 7.12 | For dry boreholes, water levels values changes. The initial value will be zero, but if you check again later you will find a new value. (which value is taken as correct) | Zero values only apply if it's an artesian or obstructed water level

All relevant fields are in NGA each data user must use his/her own judgment. | No | |

8. HYDROCENSUS FORM				
No	**Problem statement**	**Solution**	**Action**	**Comments**
8.1	There must be a summarized column of basic Hydrocensus geology	For Hydrocensus you only record what you can observe - you can't record geology because you can't see it http://www.dwaf.gov.za/Groundwater/forms.asp There is NGA form which provide all modules including geology The NGA form will be kept updated to be in line with the NGA	No	
8.2	There must be a comments column to make it flexible for any user to give a comment	The Hydrocensus form has enough space for comments The field for comments will stay on the paper, it will not be captured on NGA. See 8.3	Yes	Log this in the 'Stakeholder Request'
8.3	The comment column will help in comparing the old and new information	Currently no comments fields on NGA – a generic comment field is under consideration	Yes	Log this in the 'Stakeholder Request'

9. DATA ACQUISITION				
No	Problem statement	Solution	Action	Comments
9.1	Target audience must be taken into account	On regular basis we'll report back and interact with NGA stakeholders	Yes	Devise a 'Communication Strategy'
9.2	There is a limited support on requests	NGA is web based, so everybody has access For high level enquiries, there's an e-mail address 'Groundwater Enquiries'	Yes	Ensure that this address appears in NGA introduction
9.3	Data acquisition is not up to scratch	DMA	Yes	Ensure that this aspect is adequately addressed
9.4	Is data acquisition made compulsory	DMA and discussions with the Director	Yes	Discuss the issue of a DMA with Director
9.5	Improved Business process in supplying data is required	See 9.4	No	
9.6	Government need to provide back up for WUA, municipalities and consultants	This addressed through the structure of groundwater governance	Yes	Groundwater Governance needs a lot of discussions
9.7	There need to be a spatial distribution of the aquifer reaction (GIS)	Information products to be available on the web, some of them are already there Project to collect real time data in process on initiation	Yes	Communicate progress of project with users

No	Problem statement	Solution	Action	Comments
9.8	Core drilling logs required in the Cape	Project 28 (registration for drilling contractors) http://www.dwaf.gov.za/Groundwater/default.asp Drilling methods cater for core drilling and geological logs	Yes	When we start developing 'Geology Module' the Western Cape will be involved
9.9	There is uncontrolled drilling and lack of communication	Project 28	Yes	Communicate progress of project with users
9.10	How to convince groundwater community to submit data	Project 28 and DMA	Yes	Communicate progress of project with users
9.11	Bulk upload of test pumping data recorded on electronic loggers	To be investigated	Yes	Bulk upload requirement
9.12	There need to be one entry point for data requests	Georequest already exist georequests@dwaf.gov.za	No	

No	Problem statement	Solution	Action	Comments
10. DATA QUALITY				
10.1	Concerns about data quality, assurance and control	Regions will ensure data control Business rules has been built in for assurance The DMA covers data Auditing There is the SGD which is the measure of data quality	Yes	Ensure that the DMA clearly reflects this issue
10.2	Water level updates in the Open-NGDB is required	Static water level and pump test water levels can be captured & updated in NGA	No	
10.3	Concerns for the migration of time-series data	Already in HYDSTRA	No	

No	Problem statement	Solution	Action	Comments
		11. <u>BOREHOLE NUMBERING/ SITE ID'S</u>		
11.1	In NGA, does each borehole going to have a new number?	Geosite numbering policy will regulate the use of the borehole numbers	Yes	Get the Geosite Numbering Policy signed and publish on web
11.2	How is the confusion of duplication going to be eliminated in NGA?	NGA Business Rules and special function cater for the elimination of duplications	No	
11.3	Site ID's get deleted and this leads to duplications	NGA will use Regional borehole numbers as Identifiers	No	
11.4	On the other numbers, is the borehole still going to have a borehole number or a DWAF number?	No, newly captured records will only have a Regional Borehole Number, but for historical records, the numbers will be retained	Yes	Ensure DMA adequately reflects this issue
11.5	It is difficult to obtain borehole numbers	Business process to be improved Web-based Geosite Numbering System has been defined	Yes	Elevate the priority of the development
11.6	There must be a link between a Geosite Numbering Database and NGA	Envisaged for the future	Yes	Elevate the priority of the development

**12. BOREHOLE DRILLING INFORMATION**
No	**Problem statement**	**Solution**	**Action**	**Comments**
12.1	If borehole is drilled by consultants and they find no water, should that be reported to DWAF?	Yes	Yes	Ensure adequately addressed in DMA
12.2	If the borehole is registered with DWAF, should it be used?	The registration of a borehole on NGA does not give you a right to use the groundwater you must register the (ground)water use on WARMS before you get the right to use it	Yes	Publish a relevant document on Web
12.3	Is there a difference between registering a borehole and getting a license?	Yes, borehole registration is for geological data. Licensing is for water use	Yes	Publish a relevant document on Web
12.4	There is unfairness in the registration of drilling companies by DWAF	Project 28	Yes	Communicate progress of project with users
12.5	Feedback need to be given to the drillers who requested to be registered as Drillers	See 12.4	No	

No	Problem statement	Solution	Action	Comments
12.6	How would you determine if the borehole is for monitoring purposes, how would you know if it is monitored regularly?	There is distinction in NGA of whether a borehole is for monitoring or not There is also an identification of whether a borehole is linked to WMS and HYDSTRA DMA will address the registration of monitoring Geosites	Yes	Ensure adequately addressed in DMA
12.7	How important is groundwater quality?	Very crucial	Yes	Ensure adequately addressed in DMA
12.8	Is there any assistance from government in terms of sample analysis because it is very expensive to take it to the laboratories?	No, assistance for only DWAF projects A list of accredited lab to be published on the Groundwater website	Yes	To discuss with WMS team to see if there is any agreement on the data format
12.9	What is recommended for a borehole that has been registered monitored and identified as contaminated but is continuously used by the community?	This is the responsibility of a Water Service Authority (WSA)	Yes	To discuss with Elna from RQS
12.10	Is there any initiative by DWAF to capture all the existing borehole data?	Yes, there are GRIP projects conducted in Limpopo, Eastern Cape and KZN	Yes	Discuss the need for a GRIP in all Regions

No	Problem statement	Solution	Action	Comments
12.11	There need to be a close link between the Regional offices and the Head office	There is a Groundwater Coordination Committee There is also a NGIS Steering Committee	No	
12.12	Consultants have no idea of what DWAF Head Office deals with.	Everything is on the Groundwater website	No	
12.13	Consultants find it difficult to ask for borehole numbers first before they start drilling	Web-based system to be developed in planning	Yes	Elevate the priority of the development
12.14	What methods and pump types are used for borehole testing?	There is South African Bureau of Standards (SABS) which is now called SANS (South African National Standards) Professional Judgment should be recognised	No	
12.15	Who can test boreholes?	Pump test contractors	Yes	Possibly address in Project 28
12.16	Consultants don't receive government tenders and they have stopped attending borehole drilling meetings	Project 28	Yes	Communicate progress of project with users
12.17	DWAF contractors must be used for borehole drilling	Project 28	Yes	Communicate progress of project with users

No	Problem statement	Solution	Action	Comments
12.18	There is discrimination from the Construction Development Board when it comes to granting of tenders	Comment	No	

13. WATER USE AUTHORIZATION				
No	**Problem statement**	**Solution**	**Action**	**Comments**
13.1	There need to be an indication of whether the borehole captured is licensed or registered	See 13.2 and 13.3 Link to be created between WARMS and NGA	No	

No	Problem statement	Solution	Action	Comments
14.1	Mechanisms to convince the groundwater community to submit/enter data	DMA	Yes	Ensure adequately addressed in DMA
14.2	Std Geosite Descriptor – good but standard forms missing	NGA forms already available – in future will be downloadable	No	
14.3	Data from for instance WUA should also be stored (AquiMon data)	In NGA it's not stored anywhere right now	Yes	Discuss the storing of WUA data (forum needs to be identified)
14.4	Standardized reports a must	NGA will contain static reports which will later be dynamic reports	Yes	Log request in 'Stakeholder Request'

Table header: **14. GENERAL** spanning all columns.