ACC-Dar Borehole Monitoring Database

This technical note provides information to facilitate use of the ACC-Dar Borehole Monitoring Database (BMD).

After downloading the database (ACCDAR official BMD) from the link <u>http://www.planning4adaptation.eu/042_Maps.aspx</u>, you can open the file with MS Access.

The monitoring network is made up of 79 boreholes. Through the BMD, technical and historical chemicalphysical data on the boreholes can be accessed and updated according to information gathered through present and future survey activities.

The ACC-Dar BMD structure is presented in Figure 1.

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Figure 1: ACC-Dar BMD main page

The **Main Panel** is displayed in the middle of the ACC-Dar BMD main page, while the left-hand menu lists all the other items in the database:

➡ Tables: data are organized in tables, related to each other through a system of primary keys (in this case, the borehole ID, which consists of the first three characters of the district in which it is located and a code number).

The tables contain data relating to:

- Diz district (Ilala, Kinondoni and Temeke)
- Diz Use (land cover)
- Diz wards
- <u>Geographic</u> (Borehole ID, District, Ward, Latitude, Longitude, Area, DDCA ID, Owner, Address, Phone)
- In situ (Date, SWL, DWL, Q, T, pH, EC, TDS)
- Lab (Concentration value for lab parameters expressed in mg/l)
- Screens

- Stratigraphies
- Tables
- <u>Tecnichal</u> (Year of construction, Ground level, Depth, Well bottom level, h wellhead, Diameter, Depth of pump, Water use, Yield)
- ⇒ Query: some specific queries have been built to quickly recover the most interesting data:
 - Chemical (chemical analysis)
 - EC (electrical conductivity)
 - Hydraulic head (static water levels)
 - Stratigraphy
- → Masks: are the elements that allow the user to interact with the data in the tables or queries
 - Main panel
 - Msk boreholes
 - Submsk filters
 - Submsk geografic
 - Submsk lab
 - Submsk measures
 - Submsk stratigraphies
 - Submsk tables

➡Macro: are instruction sequences.

1. Input data

Click Input data (Figure 2) to view all the information related to a selected borehole



Figure 2: ACC-Dar BMD main page - Input data

To select a borehole, type its ID number in the field <u>ID borehole</u> or scroll through the records with the arrows at the bottom left of the screen (Figure 3).

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Figure 3: Input data – ID Borehole

Mask Input data show information about localization, technical characteristics, stratigraphy, in situ measurements, and chemical analysis of the selected well.

> Localization: District, Ward, Area, Latitude and Longitude, Address, Owner, Phone and DDCA Report ID

(Figure 4).		
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Figure 4: Input data – Localization

Tech features: Year of construction, Ground level, Depth, Well bottom level, h wellhead, Diameter, Depth of pump, Water use, Yield (Figure 5).

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Figure 5: Input data - Tech features

Stratigraphy: contains the description of the stratigraphic report and the thickness of any lithological type (Figure 6).

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Figure 6: Input data - Stratigraphy

In situ: static and dynamic water level, piezometric levels, yield, temperature, pH, electrical conductivity, TDS - Total Dissolved Solids (Figure 7).



Figure 7: Input data – In situ

Laboratory: concentration value for lab parameters expressed in mg/l (Figure 8).



Figure 8: Input data - Laboratory

To return to the main menu Click Back to main menu.

2. SWL query

Click <u>SWL query</u> (Figure 9) to display geographic coordinates (Latitude and Longitude) and measures of the static level (SWL) (Figure 10) for all the wells available.





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Submsk filters	ILA010	39.2386666667	-6.826		9						
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Figure 10: SWL query

Click <u>EC query</u> (Figure 11) to show geographic coordinates (Latitude and Longitude) and electrical conductivity (EC) (Figure 12) for all available boreholes.

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Figure 11: ACC-Dar BMD main page – EC query

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screens	ILA004	39.21372	-6.83	797	3100	7/23/2012								
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tables	ILA008	39.281	-6.8131666	667	1693	1/31/2013								
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Hydraulic Head	ILA009	39.2751666667	-6.8211666	667	1054	1/31/2013								
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Stratigraphy	ILA010	39.2386666667	-6	826	777	1/31/2013								
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Figure 12: EC query

4. Lab analysis query

Click <u>Lab analysis query</u> (Figure 13) to display geographic coordinates (Latitude, Longitude) and chemical analysis (Lab) (Figure 14) for all the wells available.



Figure 13: ACC-Dar BMD main page – Lab analysis query

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geographic	ILA004	39.21372	-6.83797	11/14/2012	299	220		891		15	7	
insitu	ILA005	39.19099	-6.84386	8/8/2012	92	40		170		5	74	
Lab lab	ILA005	39.19099	-6.84386	11/15/2012	129	63		244		586	78	
screens	ILA008	39.281	-6.8131666667	6/13/2012	74	15		332		23	307	
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chemical	ILA011	39.259	-6.8268333333	6/14/2012	172	16	i	130		16	190	
EC EC	ILA011	39.259	-6.8268333333	11/14/2012	197	21		168		11	180	
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stratigraphy	ILA013	39.2245	-6.8483333333	6/14/2012	64	42		284		24	34	
Forms	ILA013	39.2245	-6.8483333333	11/15/2012	27	17		170		3	28	
🔠 Main panel	ILA014	39.22885	-6.85925	6/13/2012	49	33		266		9	52	
🗐 Msk boreholes	ILA014	39.22885	-6.85925	11/15/2012	102	35		197		6	39	
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Submek lab	ILA016	39.21126	-6.85664	6/14/2012	45	17		113		17	69	
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Figure 14: Lab analysis query

5. Creating a Query

As with all relational databases, in the ACC-Dar BMD it is possible to limit the display of data to specific records without modifying the structure of a query, mask or table.

Through the *Filter* tool, you can define a specific standard that identifies the value of the field that you want to display.

For example, if you want to create a query containing only chlorine concentration of the well ILA002 collected in the campaign of June 2012, click *Query Design* in *Create* tab (Figure 15).

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diz districts	ILA002	39.20719	-6.82402	11/14/2012	248	25	258	29	317	
Diz use	ILA003	39.2267333333	-6.8334166667	6/14/2012	119	26	216	10	275	
diz wards	ILA003	39.2267333333	-6.8334166667	11/14/2012	93	33	573	3	154	
aeographic	ILA004	39.21372	-6.83797	8/10/2012	650	144	582	9	78	
geographie	ILA004	39.21372	-6.83797	11/14/2012	299	220	891	15	7	
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screens	ILA008	39.281	-6.8131666667	6/13/2012	74	15	332	23	307	
stratigraphies	ILA008	39.281	-6.8131666667	11/14/2012	109	21	308	16	335	
tables	ILA009	39.2751666667	-6.8211666667	6/13/2012	201	16	106	29	196	
	ILA009	39.2751666667	-6.8211666667	11/14/2012	225	23	90	8	234	
technical	ILA010	39.2386666667	-6.826	6/14/2012	83	14	133	58	147	
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chemical	ILA011	39.259	-6.8268333333	6/14/2012	172	16	130	16	190	
EC	ILA011	39.259	-6.8268333333	11/14/2012	197	21	168	11	180	
Hydraulic Head	ILA012	39.239	-6.8366666667	6/14/2012	32	13	240	9	208	
Stratigraphy	ILA012	39.239	-6.8366666667	11/15/2012	54	17	204	7	209	
	ILA013	39.2245	-6.8483333333	6/14/2012	64	42	284	24	34	
rorms ×	ILA013	39.2245	-6.8483333333	11/15/2012	27	17	170	3	28	
Main panei	ILA014	39.22885	-6.85925	6/13/2012	49	33	266	9	52	
🖼 Msk boreholes	ILA014	39.22885	-6.85925	11/15/2012	102	35	197	6	39	
💷 Submsk filters	ILA015	39.20304	-6.85746	6/15/2012	19	13	296	9	177	
Submsk geographic	ILA015	39.20304	-6.85746	5 11/15/2012	23	15	348	11	167	
Submsk lab	ILA016	39.21126	-6.85664	6/14/2012	45	17	113	17	69	
	ILA017	39.19541	-6.8667	8/10/2012	60	8	87	3	69	
Submsk measures	ILA017	39.19541	-6.8667	11/15/2012	68	6	94	7	34	
🔚 Submsk stratigraphies	ILA018	39.18835	-6.87829	6/13/2012	27	10	189	5	32	•
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Figure 15: Query creation (Step 1)

In the *Show Table* dialog box (Figure 16) click the tables from which you want to recover data, in the example *geographic* and *lab*.



Figure 16: Query creation (Step 2)

Each table will be displayed in a window at the top of the query designer. Click Close after you have added all the tables (Figure 17).

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Figure 17: Query creation (Step 3)

Now it's necessary to insert a link between borehole IDs, which represent the primary key of the system (primary keys) (Figure 18).



Figure 18: Query creation (Step 4)

In each table, click the field or fields that you want to use in the query. Each field will be displayed in a blank cell in the Field row of the grid. In the example, select ID borehole (ILA002), chlorine content and date. Optionally, you can add criteria in the Criteria row of the query grid. In the example, to filter the data concerning the campaign of June 2012 it is necessary to write the string (like * 06/2012) in the criteria section.



Click Run to run the query (Figure 19) and display the results in a datasheet (Figure 20).

Figure 19: Query creation (Step 5)

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