DANMARKS OG GRØNLANDS GEOLOGISKE UNDERSØGELSE RAPPORT 2002/82

GREENCORE: the database for the Bureau of Minerals and Petroleum's Drill Core Library in Greenland

– A user manual

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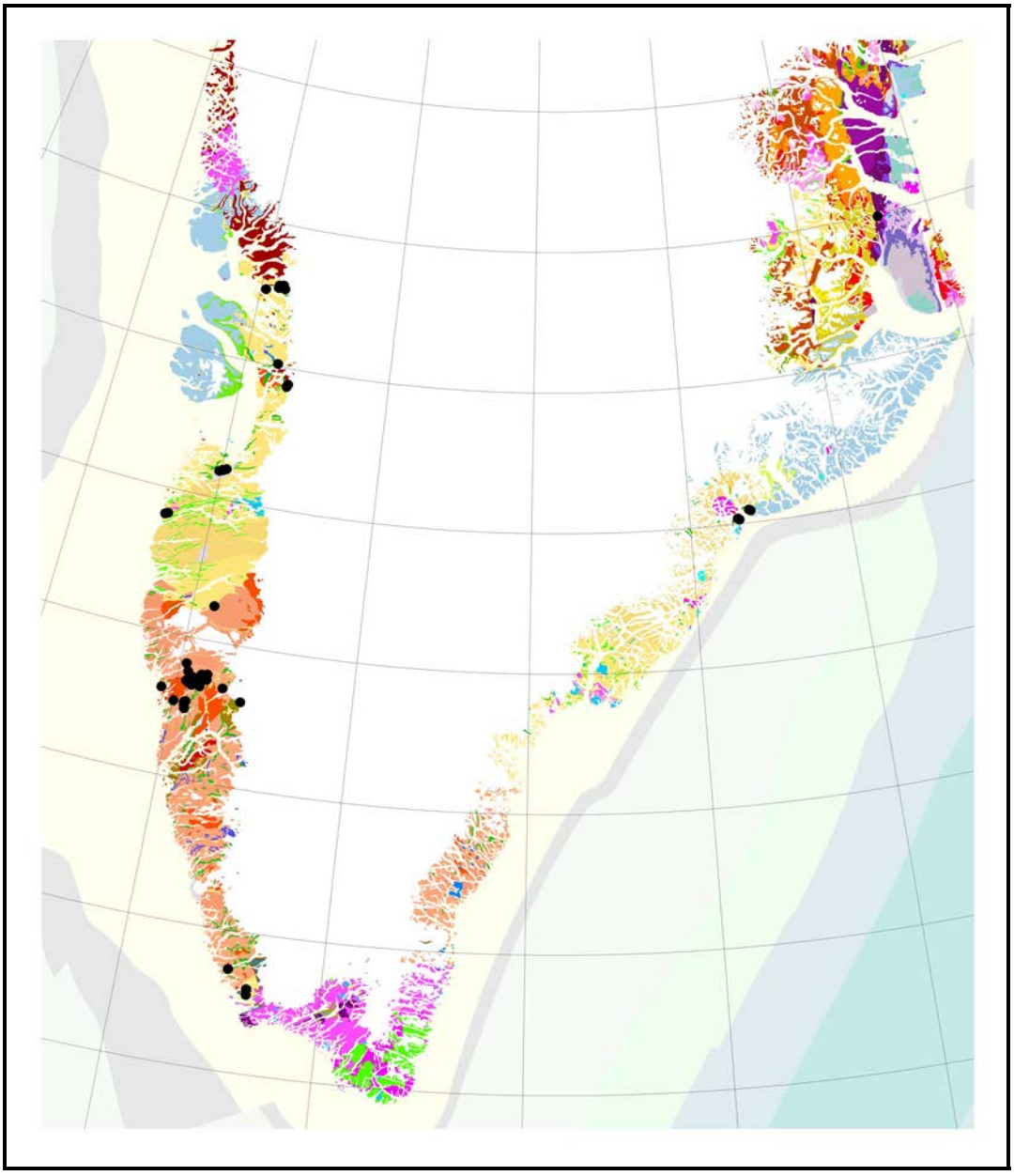


Frontispiece: Example of plot of GREENCORE localities produced in ArcView. A selection of sites (black dots) with drill cores registered in GREENCORE plotted on top of a digital geological map. In ArcView, it is possible to zoom in and obtain further information about the individual drill core. Produced by Frands Schjøth.

CONTENTS

Abstract

This manual introduces the general reader and compiler of data to the GREENCORE database, used for the registration of drill cores in the Bureau of Minerals and Petroleum's diamond drill core library. GREENCORE is a stand-alone part of the GimmeX system (Geoscience Information management for Mineral Exploration in Greenland) and is hosted by the MS Access 2000 database system. It contains a number of screen-forms for data entry to GREENCORE, and all of these are shown and explained. Thus, this GEUS report will function as a manual for compilers of data as well as for users. A list of all GREENCORE tables and attributes is also included in the report.

Introduction

GREENCORE (Greenland drill core database) is used for registration of cores in the Bureau of Minerals and Petroleum's (BMP) diamond drill core library. The purpose of the core library is to make drill cores from explored and mined mineral deposits in Greenland available for industrial and scientific investigations. All drill cores are available for re-logging and sampling, subject to prior agreement with BMP. The library is accessed through BMP, or the appointed handler of the facility, Greenland Service Partners A/S.

The diamond drill core library was established in 1989 at the former Geological Survey of Greenland (GGU) in Copenhagen. This followed after the closure of three mayor mining companies operating in Greenland: Kryolitselskabet Øresund A/S (the Cryolite Co.), Nordisk Mineselskab A/S (the Northern Mining Co.) and GREENEX A/S (Schønwandt 1990). Cores from these private companies were offered to the GGU at that time, and still form the nucleus of the drill core library. In 1999 the library was transferred from Copenhagen to Kangerlussuaq airport in West Greenland, where a storage facility was established in a renovated sweepers garage by BMP. At the time of the transfer, the library hosted material from 864 drill cores. More cores will be added to the facility in Kangerlussuaq as they become available, under the authority of BMP.

The GREENCORE database was established by the Geological Survey of Denmark and Greenland (GEUS) following the transfer of the library to the BMP. The database containing all available data on the cores transferred to Greenland was delivered to BMP 31 May 2002. From this date onwards, BMP is responsible for the maintenance of the database in co-operation with GEUS. BMP contact for GREENCORE is Jette Blomsterberg.

GREENCORE has been constructed according to the rules for the GimmeX system (Geoscience Information Management for Mineral Exploration in Greenland, Thorning 2002). The database resides on the MS Access 2000 database system. The use of modern Windows based desktop software greatly enhances the number of ways in which BMP and GEUS can use GREENCORE to service the mining industry. It contains geographical, technical, company, administrative, storage, visitors and bibliographic information related to the drill cores in the core library. Geographical and technical information are compiled from company reports. The administrative part of GREENCORE includes information on mineral licenses and confidentiality of company data and includes sufficient information to link to GREENMIN (Greenland Mineralisation database, Thorning *et al*. 2000). The bibliographic part includes references to reports containing drill logs submitted to the BMP by license holders.

In support of the tables and attributes defined in GREENCORE to accommodate the various topics of relevance for drill cores, the database contains a number of look-up tables (LUT). These are used to resolve the used abbreviations into clear text and make sure that the information stored in the database is homogeneous and independent of personal user choices in spelling. The system of abbreviations in look-up tables also makes it easy to export the GREENCORE database concept into other regional contexts and language environments, i.e. it can be used outside Greenland if so required.

Presently, GREENCORE is only available to employees of BMP, Greenland Service Partners and GEUS' Department of Economic Geology, in order to assist in administrative, advisory and scientific activities. Direct access for external users via e.g. the Internet is being considered, but no fixed timetable for the implementation of this can be given at the present time.

The main objective of this report is to provide a brief user guide for GREENCORE, specifically oriented towards the experienced users directly involved in the day-to-day maintenance and use of GREENCORE. It is not a complete description of all details in the screen-forms and their use, but the layout of the report is such that further useful hints on the use of GREENCORE can be added in future versions of this manual.

The GREENCORE database structure is designed to allow a variable degree of detail in the drill core information. Though some fields are obligatory, i.e. must be filled, few drill cores have information for all the available fields or attributes. General searches should therefore concentrate on those attributes, which are obligatory. When new information on new drill cores are added to the core library, care should be taken to fill as many database fields as possible, also the non-obligatory fields.

The database tables and attributes of the GREENCORE database are listed in Appendix 1.

General remarks

This section of the report provides some general rules, guidelines and explanations in common for all the screen-forms.

Layout of screen-forms

The menu and screen-forms have been designed to be as consistent and safe as possible, using comparable layouts, colours, and nomenclature on all screen-forms. The screen-forms are to a great extent self-explanatory, and only some special features needing special attention are discussed in more detail. The following conventions have been observed throughout:

- *Italics* refer to text written near the individual field on a screen-form as a label to the required input to that field.
- **Bold characters in box** refer to buttons on the screen-form itself.

Colour coding and typesetting of fields and buttons on the screen-forms give additional information on the fields, following these rules:

- Fields in green are index fields that must be filled in.
- Fields in blue: these fields are obligatory and must be filled in. If no information is available, use n.a. if it is a field for characters or 99999 for numbers. If the field is linked to a LUT, there will be a suitable value to put in for unknown or not available (e.g. to accommodate historic data where the information has been lost).
- Fields in white: these fields are optional; information can (and should) be entered if available.
- **List** buttons with red letters: these are used to activate **LUT** assistance. Look-up tables (LUT) both simplifies and rationalises the use of screen-forms.
- For fields requesting dates, use six digits: DD-MM-YY.
- Specific colours are assigned to **New**,  , **Save**, **Cancel** and **Close** buttons.

New provides information on the actual id-number, which appears at the bottom line of the screen form. Note that the precise use of it depends on the screen-form.

 is a search function. Once the cursor is placed in the actual field to be used for the search, this button must be activated before the search information is typed into the field.

Cancel will clear the entries in all fields on the screen-form. This will in no way affect the existing information in the database, only the screen-form.

Close will leave and close down the screen-form without affecting the database. The user will be returned to the opening page.

When the corrected or new data have been entered into the fields of a screen-form, the user must use Save to commit the information to the database before moving on to the next screen-form.

Software platform: MS Access 2000

Most of the databases in GimmeX have been constructed using the Ingress Relational Database Management System. For the purpose of GREENCORE it was decided to use MS Access 2000 as the database platform program. The reason for this was mainly the need for portability of the GREENCORE database itself between at least three different locations/installation, i.e. the Bureau of Minerals and Petroleum in Nuuk, the core library facility in Kangerlussuaq, and the Department of Economic Geology, GEUS, in Copenhagen. Also, to keep the technical aspects of the database as simple as possible, the facilities only use standard functions in Access, with very little additional programming in Visual Basic or the other programming languages related to Access. This means that REENCORE only utilises standard Access functionality.

Installation of GREENCORE

The first version of GREENCORE, created during the spring of 2002, contained the data and information available to GEUS before delivery to BMP. The database was stored on a CD-ROM to be installed on a PC at BMP's premises in Nuuk under the control of Jette Blomsterberg, BMP. Any further versions will be delivered by a similar procedure. To install GRENCORE the first time, the user must go through the following steps, assuming that the receiving PC has adequate resources and programs installed:

1. Create a directory on a hard disk under the control of the target PC, e.g. D:\GREENCORE\GREENCORE
2. Copy to this directory the entire GREENCORE database (the Access database) from the GREENCORE CD-ROM.
3. Go to "Egenskaber" for the file and remove the write protection.

The database can now be used and the content of the database can be modified or added to. Often it is convenient to be able to start GREENMIN directly from the desktop via an Icon. Once the above installation has been carried out, this shortcut can be created as follows:

4. Open the database.
5. Go to "formularer".
6. Right-click on MENU and choose 'opret genvej'.

7. Choose in ‘placering’ where the shortcut icon should be placed; standard would be the desktop.

The GREENCORE database is now ready for use and can be started by clicking on the icon on the desktop of the user’s computer.

Queries in GREENCORE

Any standard or specialised programmes in the Windows environment can do database queries in GREENCORE. With ArcView (see frontispiece), both spatial and tabular queries can be performed. Crystal Seagate Report and Access Report Generator can be used for tabular queries. Searches can be performed via the screen-forms in standard Access manner. Once the routines of how GREENCORE is to be used for normal operation by BMP and the facility in Kangerlussuaq have been worked out, it will be possible to streamline some operations suited for such routines. This is left for future developments.

Updating of GREENCORE

After the delivery of GREENCORE, the main responsibility for the future updating of GREENCORE with additional information and data rests with BMP in Nuuk. Thus, the version of the database that is hosted in Nuuk will be the primary or original copy, while the copies in Kangerlussuaq and Copenhagen are secondary. However, while much of the information can be input to GREENCORE in Nuuk, two sets of information will originate elsewhere: data on storage details in Kangerlussuaq and information on links to the GREENMIN list of references to company reports etc. in Copenhagen. A detailed procedure for how to manage this situation will be jointly worked out between BMP and GEUS, see e.g. the description of screen-form 13.

When opening GREENCORE, the first main menu gives access to all subsequent screen-forms. However, there is a recommended order in which to use the screen-forms depending on the operation being performed. Some advice and hints are given in the section on how to navigate the screen-forms.

Security of GREENCORE

GREENCORE is a single-user, stand-alone database where the user directly dictates the database-security issues. Thus, the normal local routines and conventions for the use of the computer on which the GREENCORE resides are followed, e.g. power-on password, use of the general Windows-security facilities, etc. Beyond this, it is up to each of the three installations in Nuuk, Kangerlussuaq and Copenhagen to define and observe adequate

security measures. Users should be very conscientious about how and when new data are added to the live GREENCORE on the PC's hard disk. Regular back-ups of new versions of GREENCORE should be created after each major update or at fixed times, preferably on CD-ROM.

Future developments of GREENCORE

Further developments are possible. The work routines for the use of GREENCORE will be established at the three sites during the first period of use and based on this it will be possible to create streamlined procedures for use in defined work situations. It has also been contemplated to create a version of GREENCORE for use with the 'meta-data on the web' facility under development in another joint BMP-GEUS project.

Someone reasonably skilled in Access 2000 can of course undertake the development of new forms and search routines at any of the three sites. However, GEUS recommends ensuring careful co-ordination of this in order to keep the three installations compatible and consistent.

On confidentiality

GREENCORE records based on a mineral assessment report delivered by the industry under license terms are confidential for a period of time. They have the same date of expiry of confidentiality as stated for the report from which the data are extracted. This period of confidentiality is stipulated in the licence text according to the Mineral Resources Act with affiliated standard terms and rules. In cases of doubt the Greenland Bureau of Minerals and Petroleum (BMP) should be consulted for guidance. Confidential material may be released or published only if the licensee's written prior consent is obtained.

The present administrative procedures are based on the Mineral Resources Act of June 18, 1998, though the principle for stipulation of confidentiality has remained unchanged since the 1988 amendments to the Minerals Act of November 29, 1978. This implies that reports related to a post 1988 licence are treated as confidential for a period of 5 years from the date the report was submitted to the authorities. However, the period of confidentiality will always terminate at the expiry of the licence.

During its life span a licence will often be subject to a number of adjustments such as change of area or transfer to a new licensee. Each adjustment will prompt a new GREENMIN **concession** (GM DBNO) entry with a new sequential number in order to separate each of these events within the GREENMIN database. In contrast the **BMP licence** number will remain unchanged. A licence may be issued as renewal to an expired licence. This will be the case when a licensee wants to continue investigations within an area beyond the present licence period, i.e. when passing from the first licence period (years 1–5) into the second licence period (years 6–10). The important point to notice is that for a continuous chain of events (including expiry of one licence and the granting of a succeeding licence),

the confidentiality is governed by the ’five years rule’. It is only when this succession is terminated, that the ’expiry of licence rule’ becomes effective. All these issues also determine the confidentiality of information concerning drill cores in GREENCORE.

Navigating the screen-forms

On the following pages of this report each screen-form is described separately in a section. Each section contains two sub-sections with headings **Purpose** and **Fields** and an illustration showing the particular screen-form. Usually there will be some information under both subheadings, but not always. Not all fields are treated in the text, as some are self-evident.

When the corrected or new data have been entered into a field of the screen-form, the user must use Save to commit the information to the database before moving on to the next screen-form. This is when the new information is actually entered into (committed to) the database. Even if the information is visible on the screen-form, it is not part of the database until the **Save** button has been used.

Each of the thirteen screen-forms (1 – 13) corresponds to a table in GREENCORE. Referring to the entries in a table, the arrows after "Post" at the bottom line of each screen-form have the following use (standard Access):

I◄ Go to start – the first record in the table

◄ Back – go to the previous record in the table

► Forward – go to the next record in the table

►I Go to end – go to the last record in the table

► Go to end + 1 – Prepare for a new record in the table

Screen-form 0: The GREENCORE menu

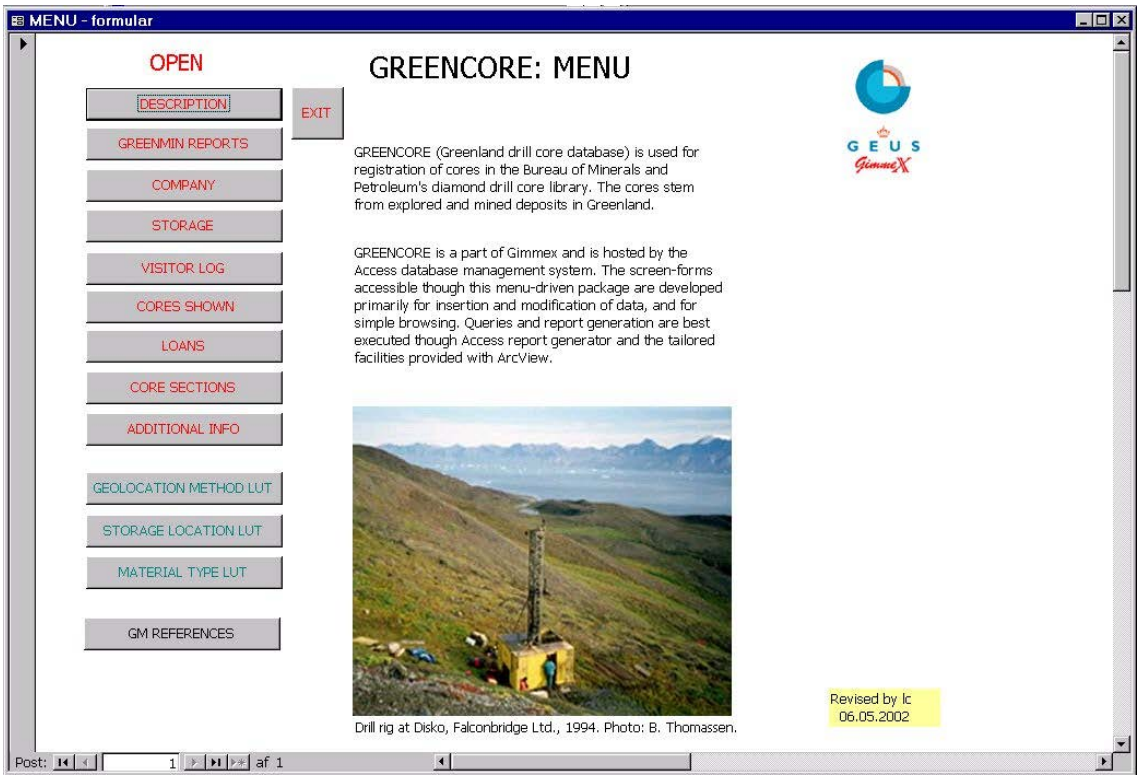


Figure 1.

The GREENCORE start page is shown in Figure 1. The menu provides direct access to all screen-forms for browsing. To minimise the risk of errors, a few restrictions have been put on how the user may navigate between screen-forms, but to a large extent the user may use the forms as best suited for the purpose. The system has been set up to allow logical use of the forms depending on the type of operation desired.

Some of the attributes in the database function as keys for the combination of data in different tables. This means that the screen-forms should be used in a certain order to make the input of new data as smooth as possible.

For instance, when desiring to add the description of a new core to GREENCORE, the first screen-form to be addressed must be screen-form 1: Description. On this a new database **Core id** can be created and the information related to this can be entered. Once this has been done and saved in the database, that particular core is said to exist in the database and then other pieces of information can be entered as appropriate (screen-forms 2, 3, 4, 8, 9) and in any order. If it is attempted to enter information on any of these *without* first using screen-form 1, the user will get an error message and the input operation will fail. Similarly,

a ‘visit’ must be defined on screen-form 5, before information can be entered on screen-form 6.

The LUT are special tables. They are used to ensure that only legal values are used for these fields. For instance, on screen-form 1, the reference to the company is given by the Company id. This field uses a LUT, and therefore the user can only put in values for Company id that are already in the Company table, by using the drop down list which is available through the small arrows at the field. If the desired company is not on this list, clicking on the Company button next to the field can open the Company table and the new company can then be typed into the table, and subsequently linked to the Company id on screen-form 1.

Screen-form 1: DESCRIPTION

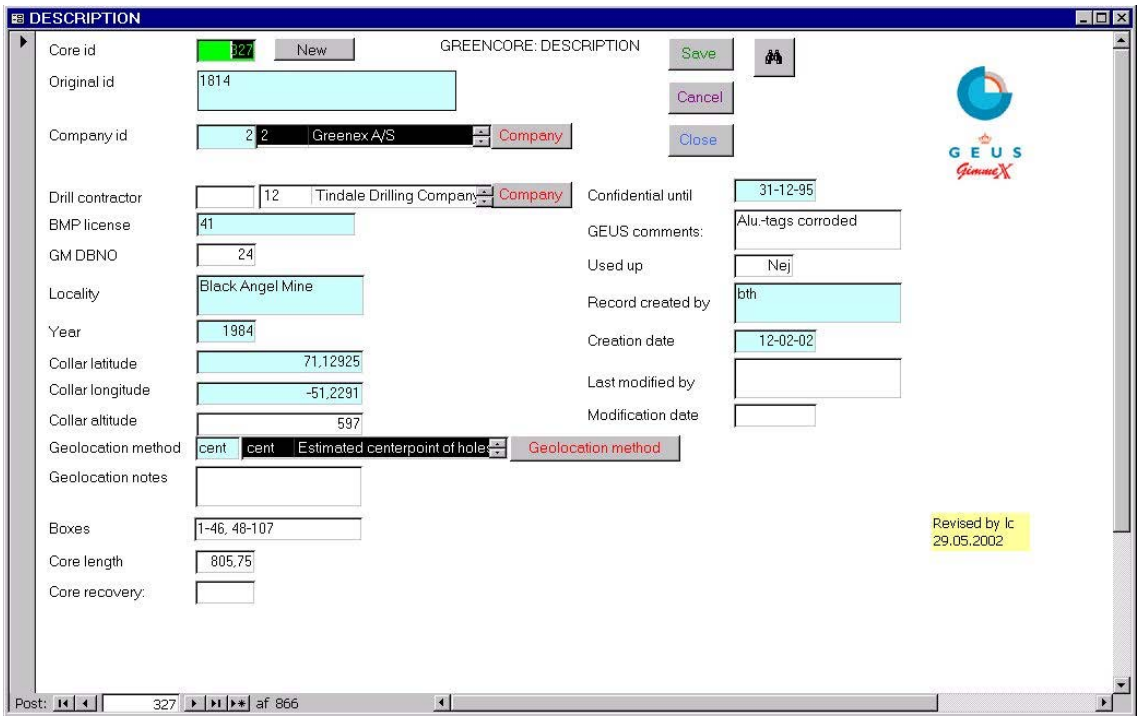


Figure 2.

Purpose

The DESCRIPTION screen-form is used to enter a description of the actual, physical cores on storage and their relations to company, license and location (Figure 2).

Fields

Core id:

The core id is a unique, five-digit number, which must be filled in after using the **New** button to identify the number at the bottom line. This is were the Core id is created and therefore this screen-form is the first place where information about this core must be entered

Original id:

The original number or label for the drill hole, usually given by the original operator and used for reference to information on the drill core given in original reports.

BMP licence:

The official licence number as stated in the licence document.

GM DBNO:

The GREENMIN concession number.

Locality:

Locality name. Only place names from the published topographic maps should be used. Provisional names from reports may be used provided they occur together with a name from a topographic base map, e.g. *Andersen Showing, Arveprinsen Ejland*. All geographical names must follow the **new Greenlandic spelling convention**.

Collar latitude/longitude:

The position of the collar of the drill hole. The topographic base for GREENCORE is G/250 Vektor, Copyright Kort & Matrikelstyrelsen, 1997–99. Where this map is not available, the G/250 or the G/100 Ortho-map sheets may be used. GPS readings are acceptable provided that the instrument is adjusted to the WGS84 (or NAD83) datum.

Decimal degrees (GG.DEC) with six decimals must always be used (and **longitude MUST always include a minus (-) sign in Greenland).**

UTM co-ordinates must be recalculated to geographical co-ordinates. Frands Schjøth/Else Dam can provide assistance if needed.

Collar altitude:

The altitude of the drill site (defined as at the collar), in metres above sea level.

Boxes

Number of boxes with cores from this drill hole.

Geolocation method:

The method used to locate the drill site.

Confidential until:

This field is related to expiry of confidentiality for the relevant mineral assessment reports submitted by the licensee. Any information on a particular core is confidential until that date.

Record created by:

Use initials.

Screen-form 2: GREENMIN REPORTS

Figure 3.

Purpose

This screen form (Figure 3) links a core description to one or more reports (table with GREENMIN references) with relevant drill-logs in the associated reports.

Fields

New:

This refers to a new entry in this table of links between a given Core id (in the table DESCRIPTION OF CORES) and a GREENMIN report no (in the table GM_REFERENCES). To establish such a link, both attribute values must already exist in these tables.

GREENMIN report no:

Each written source, from which GREENMIN information is extracted, is assigned a unique GEUS Report File (GRF) number for identification when information is compiled in GREENMIN. The entries for such reports must exist in the GREENMIN database. This means that new GREENMIN report numbers must not be generated here in GREENCORE, see the comments to screen-form 13.

Screen-form 3: COMPANY

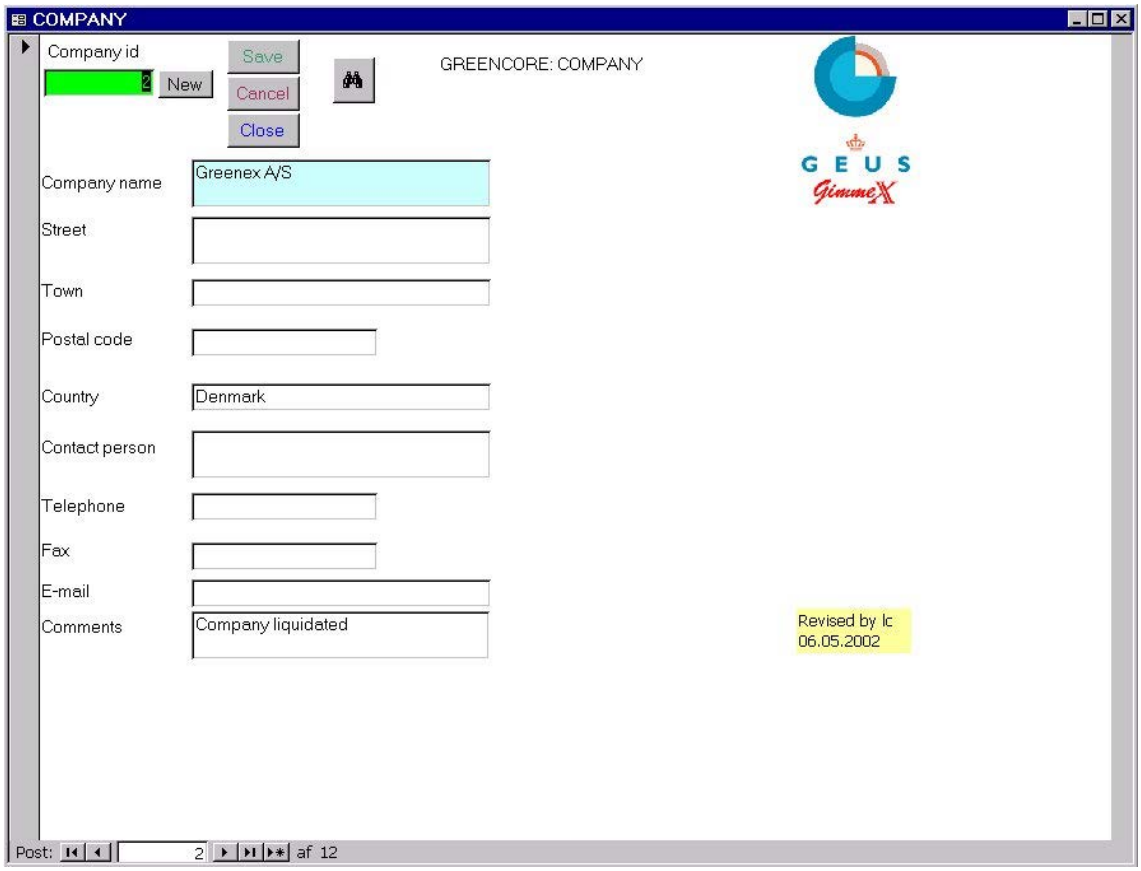


Figure 4.

Purpose

This form (Figure 4) is used for the description of the company involved in one function or another related to the core library. The fields are self-explanatory. The table behind this form is used as a LUT in other screen-forms ensuring that the company entry exists here before being used elsewhere.

Fields

Company id:

Unique number created in the database at entry. Corresponding to the situation with Core id, the Company id must exist here before it can be used (referred or linked to) in other screen-forms.

Screen-form 4: STORAGE

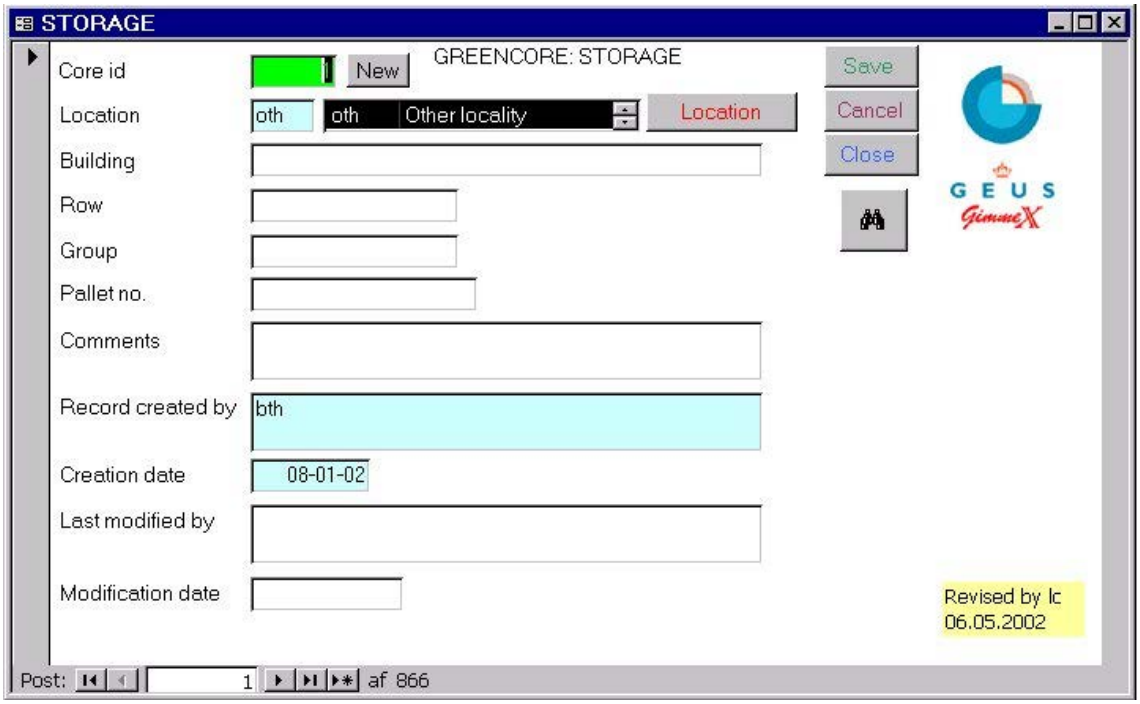


Figure 5.

Purpose

This screen-form (Figure 5) describes the actual storage location of the cores. In the version of GREENCORE transferred to BMP May 2002, only the pallet number is filled. It is up to the future handler of the core library to add the more detailed storage information as needed and when available.

Fields

New:

Refers to a new entry in this table, not to a new Core id. Remember that the Core id must exist in the database before this form can be used for that Core id.

Location:

Indicates the storage locality. Use LUT to chose between allowed values. The button with the same name can be used to add a new location to the LUT if so needed.

Screen-form 5: VISITOR LOG

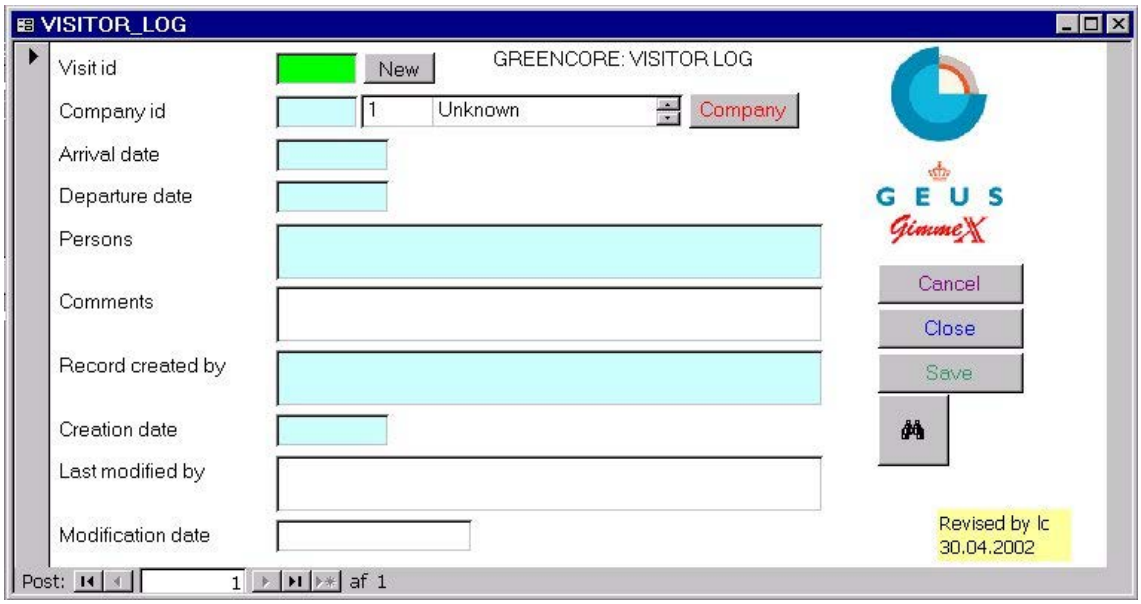


Figure 6.

Purpose

This screen-form (Figure 6) can be used to describe customer visits to the core library.

Fields

Visit id:

Unique number.

New:

Can be used to create a new entry and thus a new Visit id, because this is the first place this must be defined. When that is done, e.g. the table CORES SHOWN (screen-form 6) can be used.

Company id:

Note that this say ‘Unknown’. This is to illustrate that for all LUT (in this case the COMPANY table) one value has been provided for this type of entry, because it had to

be made available for some of the historic data to be entered into the database. Should be used sparingly or not at all for new data.

Screen-form 6: CORES SHOWN

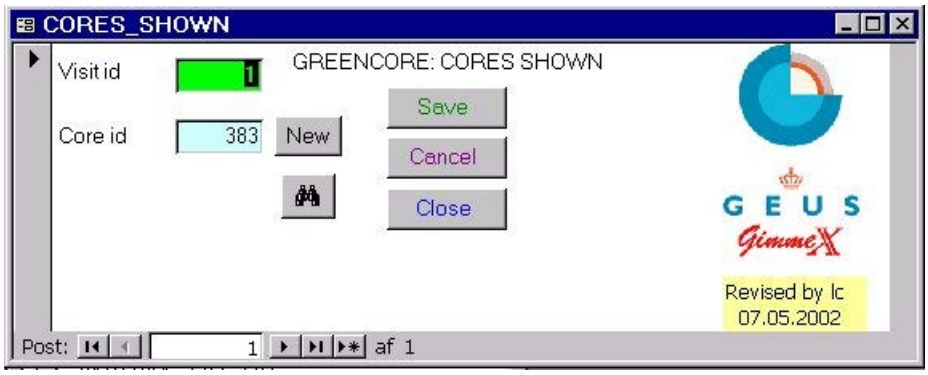


Figure 7.

Purpose

This screen-form (Figure 7) is used to register the cores displayed to visitors. The forms provide for the link to the Visit id, so more cores can be shown at one visit.

Fields

Visit id:

Unique number corresponding to the visit; must already existing in the database.

Core id:

Unique number corresponding to the core in question; must already be in the database.

Screen-form 7: LOANS

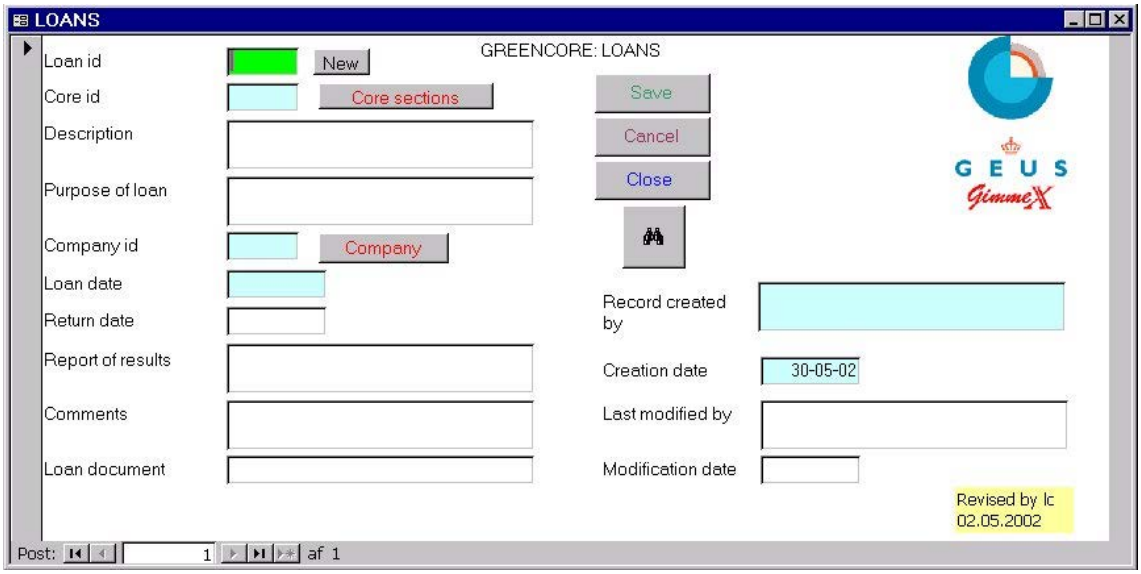


Figure 8.

Purpose

This screen-form (Figure 8) describes the loan and/or use of the cores.

Fields

Loan id:

Unique number created here which is where new loans are defined.

Core id:

Must exist.

Screen-form 8: CORE SECTIONS

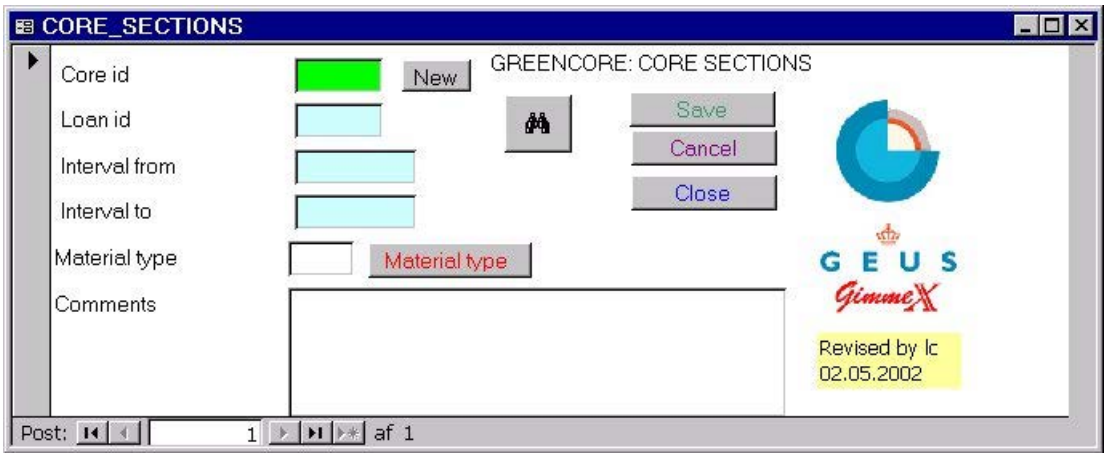


Figure 9.

Purpose

This screen-form (Figure 9) is used for specification of the material loaned.

Fields

Core id:

Use existing number.

New:

Refers to a new entry in this table, not to a new Core id.

Loan id:

Use existing number.

Material type:

The type of loaned core material.

Screen-form 9: ADDITIONAL INFORMATION

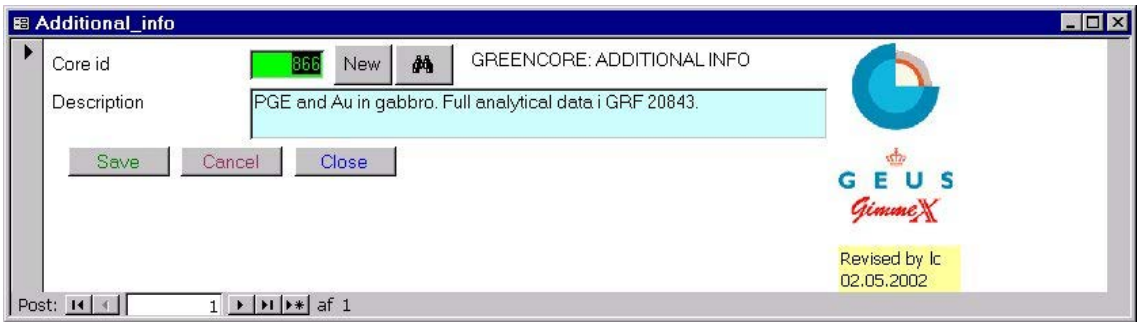


Figure 10.

Purpose

This screen-form (Figure 10) provides a possibility to include information which can not be included in the previous forms, but which is still relevant for users of the database.

Fields

New:

Refers to a new entry in this table, not to a new Core id.

Description:

For instance, reference to analyses carried out at a later state.

Screen-form 10: GEOLOCATION METHOD LUT

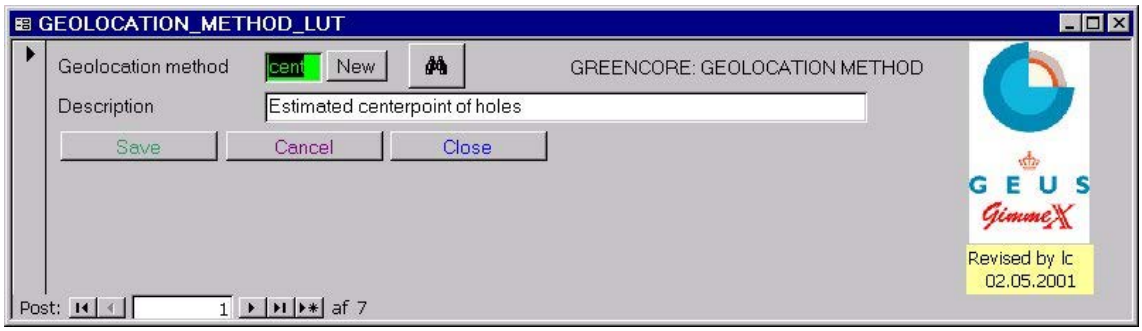


Figure 11.

Purpose

This screen-form (Figure 11) is used to describe the method used to localise the drill site. Note that this and the following forms are LUT (Look Up Tables) which have a special function. The 'Geolocation method' field on screen-form 1 (Description) can activate access to the table handled by the screen-form shown here. If the Geolocation method LUT already contains an entry, which fit a particular core, this can be used. If not, a new entry must first be created by using this form, and then linked to the Core id. The fields are self-explanatory.

Screen-form 11: STORAGE LOCATION LUT

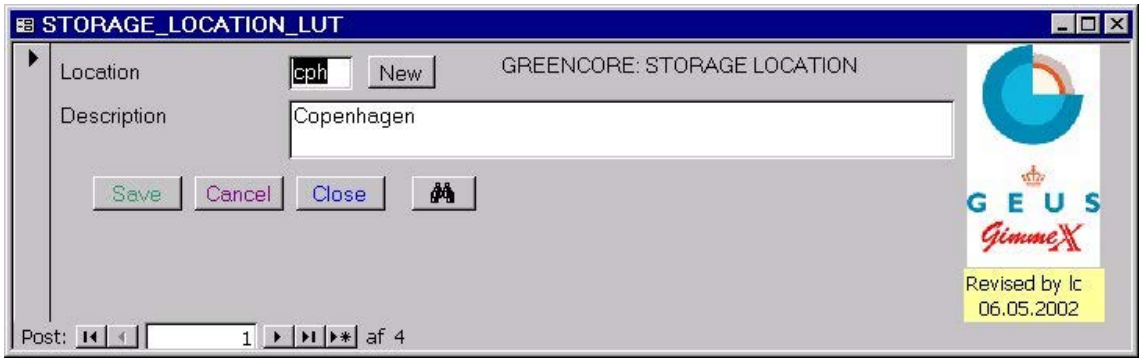


Figure 12.

Purpose

This screen-form (Figure 12) is used to define the core storage location. The fields are self-explanatory.

Screen-form 12: MATERIAL TYPE LUT

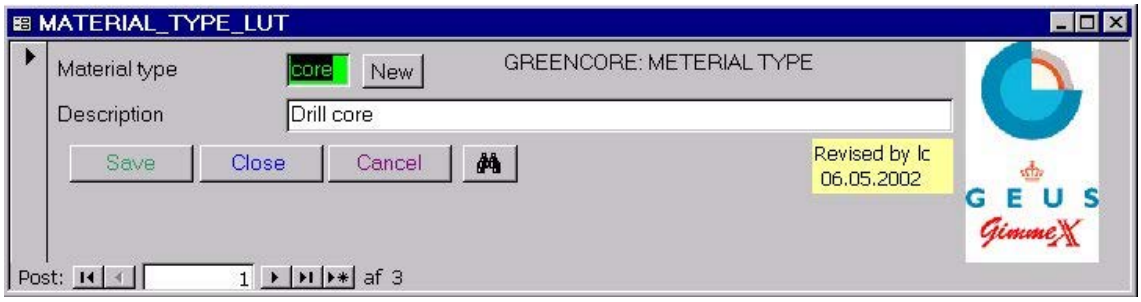


Figure 13.

Purpose

This screen-form (Figure 13) is used to describe the type of core material. The fields are self-explanatory.

Screen-form 13: GREENMIN REFERENCES

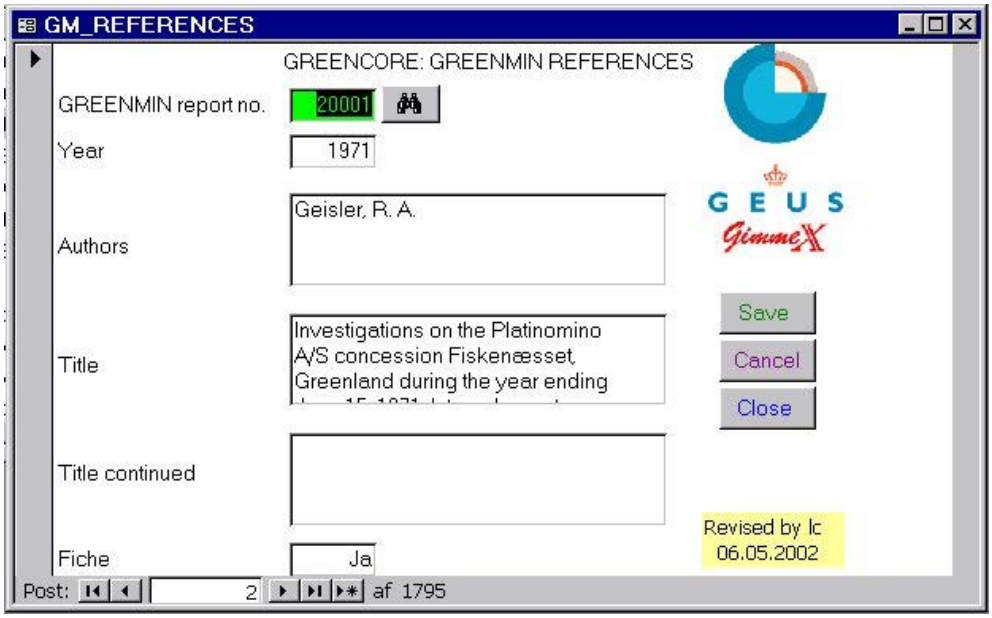


Figure 14.

Purpose

This screen-form (Figure 14) provides a subset of bibliographic information for a GREENMIN report number. The information originates from the GREENMIN database, which is run by GEUS (Department of Economic Geology). At regular intervals, GEUS will produce an updated version of this table to BMP, so that it is available for GREENCORE. It is necessary to do it this way, because GREENCORE is a stand alone database, which exist in other environments than that of GEUS, and therefore cannot rely on direct, database managed links to GREENMIN.

GEUS will forward a text-formatted file extracted from the database on diskette, CD-ROM or by e-mail. If the file arrives by e-mail then save the file to the hard disk. The file is optimal for Access and does not contain any column headings. The file will contain the new information (from a certain reference number and up) to be **added** to the existing table GREENCORE: GM_REFERENCES. The following procedure must be used when updating this table:

1. Open GREENCORE
2. Go to “filer” in the menu top left
3. Choose " Hent eksterne data"
4. Choose "Importer"
5. Choose the file name of the file received from GEUS
6. Choose "næste"
7. Make sure that the "tabulator" box is checked
8. For "I en eksisterende tabel" choose GM_REFERENCES
9. Choose "næste"
10. Chose “udfør”

When the operation is finished all the new data have been added to the table GM-References in GREENCORE, and new links between these references and Core id’s can be defined on screen-form 2.

Note that if a new table called “???_importfejl” has appeared in the list of Tables of GREENCORE, this indicates that something went wrong in the operation. Send this table attached to an e-mail to bth@geus.dk.

Fields

GREENMIN report no.:

Each written source, from which GREENMIN information is extracted, is assigned a unique GEUS Report File (GRF) number for identification. This is an ongoing process in the running of GREENMIN (primary storage for this information) and consequently this table must be continually updated with new reports. The entries for these reports must exist in the GREENMIN database. **To ensure consistency of the two databases, new GRF numbers cannot and must not be generated here in GREENCORE.**

Fiche:

‘Yes’ if a Microfiche of the report exists.

References

Schønwandt, H.K. 1990: Activities within the field of mineral resources. Rapport Grønlands Geologiske Undersøgelse 148, 37–40.

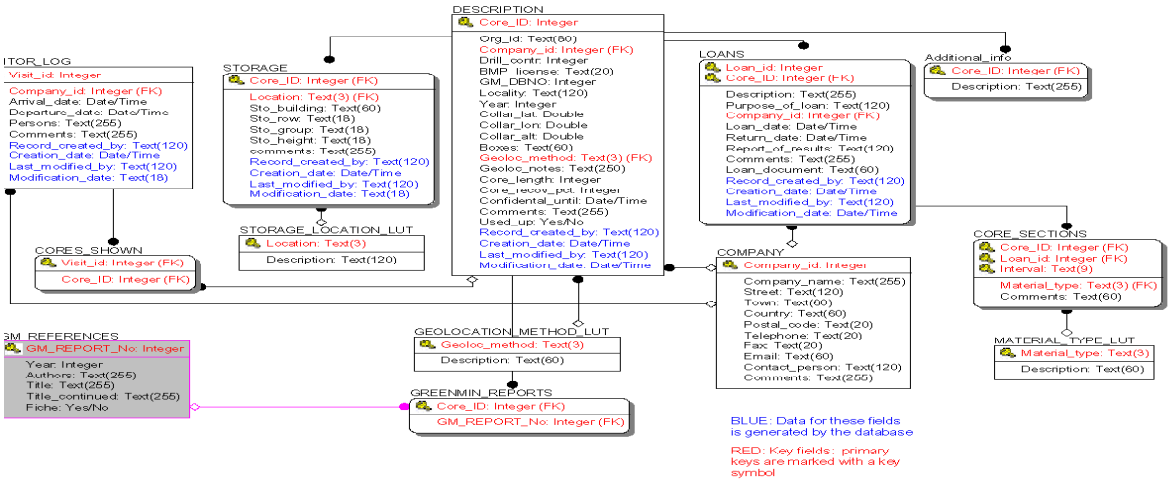
Thorning, L. 2002: GimmeX: Geoscience Information Management for Mineral Exploration in Greenland. Danmarks og Grønlands Geologiske Undersøgelse Rapport (in preparation; expected to be published December 2002).

Thorning, L., Christensen, L. Aa., Lind, M., Stendal, H. and Tukiainen, T. 2000: GREEMIN Introduction and user manual. Danmarks og Grønlands Geologiske Undersøgelse Rapport 2000/5, 67 pp.

Appendix 1

In this appendix the data model behind GREENCORE and the definitions of attributes and tables can be viewed. The information is from: Thorning, L., Thomassen, B., Lind, M., Tukiainen, T., Christensen, L. Aa. (2001): “Designdokument til GREENCORE”. GimmeX-Notat 6.1, 11. June 2001, GEUS.

Data Model



The data model is produced in ERWIN, the program used for professional data modelling in the Department for Economic Geology. The model can be used to understand the relationships between the entities making up GREENCORE. Note that for simplicity, the screen-forms shown in this manual have been constructed to correspond to the tables. In future developments it is entirely possible to create new views (and associated screen-forms) corresponding to defined work situations. Underlining of the attribute number means that the field is obligatory and must be filled in.

Tables and attributes

Entity	DESCRIPTION OF CORES (DC)	This group of attributes describes (metadata) the actual, physical cores on storage and their relations to company, license and location

No	Name	Definition	Type	Comments
DC-1	Core_id	Unique no generated by database	Unique Integer	Primary key
DC-2	Org_id	The original number, id or label for the drill hole	Character	
DC-3	Company_id	Reference to the company which has/had the license	Integer	Foreign key, refers to table Company_lut
DC-4	Drill_contr	The contractor which carried out the actual drilling	Integer	Ditto
DC-5	BMP_License	The official license no	Character	
DC-6	GM_ DBNO	The GREENMIN database no	Integer	Foreign key, refers to GREENMIN Concession Data
DC-7	Locality	Locality name	Character	New spelling, sometimes unofficial names
DC-8	Year	The year the drilling was carried out	Integer	
DC-9	Collar_Lat	Latitude (GimmeX standard) of the collar of the drill hole	Floating	Decimal degrees; if necessary with transformations as in GREENMIN
DC-10	Collar_Lon	Longitude (GimmeX Standard) of the collar of the drill hole	Floating	Decimal degrees
DC-11	Collar_Alt	Altitude (height) of the collar	Floating	Meters relative to sea level
DC-12	Boxes	Number of boxes with cores	Character	
GM-12	Geoloc_method	Geolocation method	Character	Foreign key, refers to table Geolocation_method_lut
DC-13	Geoloc_notes	Notes, free text, on original localisation, local co-ordinates, grids etc	Character	
DC-14	Core_length	Total length of the HOLE	Meters	
DC-15	Core_recov_pct	Core recovery percentage from the HOLE	Integer	
DC-16	Confidential_until	Information is confidential until the date given	Date	Must be in agreement with GREENMIN
DC-17	Comments	Comments	Character	
DC-22	Used_up	Core left	Yes/No	
DC-18	Record_created_by	Original compiler	Character	Generated automatically by the database engine
DC-19	Creation_date	Date of original compilation	Date	Ditto
DC-20	Last_Modified_ by	Name of the last person to modify the content of this record	Character	Ditto

DC-21	Modifica-tion_date	Date of last modification	Date	Ditto

Entity	**GREENMIN_REPORTS**	This group of attributes links a core description to one or more reports in Greenmin database

No	**Name**	**Definition**	**Type**	**Comments**
CO-1	Core_id		Integer	Foreign key
GMR-1	GM_report _no	Greenmin reference number	Integer	Foreign key

Entity	**GM_REFERENCES**	This group of attributes links a report number with bibliographic details

No	Name	Definition	Type	Comments
GMR-1	GM_report _no	Greenmin reference number	Integer	Foreign key
GMR-2	Year		Integer	
GMR-3	Authors		Character	
GMR-4	Title		Character	
GMR-5	Title_continued		Character	
GMR-6	Fiche	Micro fiche exists	Yes/No	

Entity	**COMPANY_LUT**	This group of attributes describes the companies involved in one function or another

No	Name	Definition	Type	Comments
CO-1	Company_id	Unique no generated by data-base	Unique Integer	
CO-2	Company_Name	Company name	Character	
CO-3	Street	Street	Character	
CO-4	Town	Town	Character	
CO-5	Country	Country	Character	
CO-6	Postal_code	Postal_code	Character	
CO-7	Telephone	Telephone #	Character	
CO-8	Fax	Fax #	Character	
CO-9	e-mail	Email	Character	
CO-10	Contact_person	Person(s)	Character	
CO-11	Comments	Comments	Character	

Entity	**STORAGE (ST)**	This group of attributes describes (metadata) the storage of the cores

No	Name	Definition	Type	Comments
DC-1	Core_id		Integer	Foreign key
SL1	Location	The geographical location of the storage facility;	Character	Foreign key, refers to Storage_location_lut
ST-2	Sto_building	Building	Character	These four cells are reserved for an exact 'address' of the core
ST-3	Sto_row	Row	Character	
ST-4	Sto_group	Group	Character	
ST-5	Sto_height	Height		
ST-6	Comments		Character	
ST-7	Record_created_by		Character	Generated by the database engine
ST-8	Creation_date		Date	Ditto
ST-9	Last_modified_by		Character	Ditto
ST-10	Modification_date		Date	Ditto

Entity	LOANS (LO)	This group of attributes describes (metadata) the loan and or use of the cores

No	Name	Definition	Type	Comments
LO-1	Loan_id	Unique no generated by database	Unique Integer	
DC-1	Core_id		Integer	Foreign key
LO-2	Description	Any further description of the material on loan	Character	
LO-3	Purpose_of_loan	The reason for the loan	Character	Analysis, destructive or not, will something come back
CO-1	Company_id	The company which borrows the sample	Integer	Foreign Key, refers to Company_lut
LO-4	Loan_date		Date	
LO-5	Return_date		Date	
LO-6	Report_of_results		Character	
LO-7	Comments		Character	
LO-8	Loan_document	BMP-journal number	Character	
LO-9	Record_created_by		Character	Generated by the database engine
LO-10	Creation_date		Date	Ditto
LO-11	Last_modified_by		Character	Ditto
LO-12	Modification_date		Date	Ditto

Entity	CORE_SECTIONS	Specification of the loaned material

No	Name	Definition	Type	Comments
CO-1	Core_id		Integer	Foreign key

DC-1	Loan_id		Integer	Foreign key
CS-1	Interval - from	Interval from	Character	Primary key
CS-2	Interval - to	Interval to	Character	Primary key
MT-1	Material_type	Type of material	Character	Foreign key
CS-3	Comments		Character	

Entity	**MATERIAL_TYPE_LUT**	Material type description

No	**Name**	**Definition**	**Type**	**Comments**
MT-1	Material_type	Type of material	Unique Character	Primary Key
MT-2	Description	Description of material type	Character	

Entity	**GEOLOCATION_METHOD_LUT**	Geolocation methods

No	**Name**	**Definition**	**Type**	**Comments**
GM-1	Geoloc_method	Abbreviation of the method	Unique Character	Primary Key
GM-2	Description	Description	Character	

Entity	**STORAGE_LOCATION_LUT**	Core storage locations

No	Name	Definition	Type	Comments
SL-1	Location	Abbreviation of the location	Unique Character	Primary Key
SL-2	Description	Description	Character	

Entity	**VISITOR_LOG (VI)**	This group of attributes describes visitors to the core library

No	Name	Definition	Type	Comments
VI-1	DB visit id	Unique no generated by database	Unique Integer	Primary key
CO-1	Company_id	The company visiting the core facility	Integer	Foreign key, refers to Company_lut
VI-2	Arrival_date	Date of arrival	Date	
VI-3	Departure_date	Date of Departure	Date	
VI-4	Persons		Character	More than one
VI-5	Comments		Character	

VI-6	Record created by		Character	Generated by the db-engine
VI-7	Creation_date		Date	Ditto
VI-8	Last_modified_by		Character	Ditto
VI-9	Modification_date		Date	Ditto

Entity	**CORES_SHOWN**	Record of cores shown at a given visit

No	**Name**	**Definition**	**Type**	**Comments**
VI-1	DB visit id	Unique no generated by data-base	Integer	Foreign key
COS-1	Core_id	Core ID number	Integer	Foreign key, refers to Descrip-tion

Entity	**ADDITIONAL _INFO**	

No	**Name**	**Definition**	**Type**	**Comments**
CO-1	Core_Id		Integer	Foreign key
AI-1	Description		Character	