EDM™ Drilling Data Migration Guide

HALLIBURTON | Landmark Software & Services

5000.1 December 2011

© 2011 Halliburton
All Rights Reserved

This publication has been provided pursuant to an agreement containing restrictions on its use. The publication is also protected by Federal copyright law. No part of this publication may be copied or distributed, transmitted, transcribed, stored in a retrieval system, or translated into any human or computer language, in any form or by any means, electronic, magnetic, manual, or otherwise, or disclosed to third parties without the express written permission of:

Halliburton | Landmark Software & Services
2107 CityWest Blvd, Building 2, Houston, Texas 77042-3051, USA
P.O. Box 42806, Houston, Texas 77242, USA
Phone:713-839-2000, FAX: 713-839-2015
Internet: www.halliburton.com/landmark

Trademarks

3D Drill View, 3D Drill View KM, 3D Surveillance, 3DFS, 3DView, Active Field Surveillance, Active Reservoir Surveillance, Adaptive Mesh Refining, ADC, Advanced Data Transfer, Analysis Model Layering, ARIES, ARIES DecisionSuite, Asset Data Mining, Asset Decision Solutions, Asset Development Center, Asset Development Centre, Asset Journal, Asset Performance, AssetConnect, AssetConnect Enterprise, AssetConnect Enterprise Express, AssetConnect Expert, AssetDirector, AssetJournal, AssetLink, AssetLink Advisor, AssetLink Director, AssetLink Observer, AssetObserver, AssetObserver Advisor, AssetOptimizer, AssetPlanner, AssetPredictor, AssetSolver, AssetSolver Online, AssetView, AssetView 2D, AssetView 3D, BLITZPAK, CasingLife, CasingSeat, CDS Connect, Channel Trim, COMPASS, Contract Generation, Corporate Data Archiver, Corporate Data Store, Data Analyzer, DataManager, DataStar, DBPlot, Decision Management System, DecisionSpace, DecisionSpace 3D Drill View, DecisionSpace 3D Drill View KM, DecisionSpace AssetLink, DecisionSpace AssetPlanner, DecisionSpace AssetSolver, DecisionSpace Atomic Meshing, DecisionSpace Desktop, DecisionSpace Nexus, DecisionSpace Reservoir, DecisionSuite, Deeper Knowledge. Broader Understanding., Depth Team, Depth Team Explorer, Depth Team Express, Depth Team Extreme, Depth Team Interpreter, DepthTeam, DepthTeam Explorer, DepthTeam Express, DepthTeam Extreme, DepthTeam Interpreter, Desktop Navigator, DESKTOP-PVT, DESKTOP-VIP, DEX, DIMS, Discovery, Discovery 3D, Discovery Asset, Discovery Framebuilder, Discovery PowerStation, DMS, Drillability Suite, Drilling Desktop, DrillModel, Drill-to-the-Earth-Model, Drillworks, Drillworks ConnectML, DrillWorks Predict, DSS, Dynamic GeoModeling, Dynamic Reservoir Management, Dynamic Surveillance System, EarthCube, EDM, EDM AutoSync, EDT, eLandmark, Engineer's Data Model, Engineer's Desktop, Engineer's Link, ESP, Event Similarity Prediction, ezFault, ezModel, ezSurface, ezTracker, ezTracker2D, FastTrack, Field Scenario Planner, FieldPlan, For Production, FrameBuilder, FZAP!, GeoAtlas, GeoDataLoad, GeoGraphix, GeoGraphix Exploration System, GeoLink, Geometric Kernel, GeoProbe, GeoProbe GF DataServer, GeoSmith, GES, GES97, GESXplorer, GMAplus, GMI Imager, Grid3D, GRIDGENR, H. Clean, Handheld Field Operator, HHFO, High Science Simplified, Horizon Generation, I^2 Enterprise, iDIMS, Infrastructure, Iso Core, IsoMap, iWellFile, KnowledgeSource, Landmark *(as a service)*, Landmark *(as software)*, Landmark Decision Center, Landmark Logo and Design, Landscape, Large Model, Lattix, LeaseMap, LithoTect, LogEdit, LogM, LogPrep, Make Great Decisions, MathPack, MDS Connect, MicroTopology, MIMIC, MIMIC+, Model Builder, NETool, Nexus *(as a service)*, Nexus *(as software)*, Nexus View, Object MP, OpenBooks, OpenJournal, OpenSGM, OpenVision, OpenWells, OpenWire, OpenWire Client, OpenWire Server, OpenWorks, OpenWorks Development Kit, OpenWorks Production, OpenWorks Well File, PAL, Parallel-VIP, Parametric Modeling, Permedia, PetroBank, PetroBank Explorer, PetroBank Master Data Store, PetroStor, PetroWorks, PetroWorks Asset, PetroWorks Pro, PetroWorks ULTRA, PlotView, Point Gridding Plus, Pointing Dispatcher, PostStack, PostStack ESP, PostStack Family, Power Interpretation, PowerCalculator, PowerExplorer, PowerExplorer Connect, PowerGrid, PowerHub, PowerModel, PowerView, PrecisionTarget, Presgraf, PressWorks, PRIZM, Production, Production Asset Manager, PROFILE, Project Administrator, ProMAGIC, ProMAGIC Connect, ProMAGIC Server, ProMAX, ProMAX 2D, ProMax 3D, ProMAX 3DPSDM, ProMAX 4D, ProMAX Family, ProMAX MVA, ProMAX VSP, pSTAx, Query Builder, Quick, Quick+, QUICKDIF, Quickwell, Quickwell+, Quiklog, QUIKRAY, QUIKSHOT, QUIKVSP, RAVE, RAYMAP, RAYMAP+, Real Freedom, Real Time Asset Management Center, Real Time Decision Center, Real Time Operations Center, Real Time Production Surveillance, Real Time Surveillance, Real-time View, Reference Data Manager, Reservoir, Reservoir Framework Builder, RESev, ResMap, RTOC, SCAN, SeisCube, SeisMap, SeisModel, SeisSpace, SeisVision, SeisWell, SeisWorks, SeisWorks 2D, SeisWorks 3D, SeisWorks PowerCalculator, SeisWorks PowerJournal, SeisWorks PowerSection, SeisWorks PowerView, SeisXchange, Semblance Computation and Analysis, Sierra Family, SigmaView, SimConnect, SimConvert, SimDataStudio, SimResults, SimResults+, SimResults+3D, SIVA+, SLAM, SmartFlow, smartSECTION, smartSTRAT, Spatializer, SpecDecomp, StrataAmp, StrataMap, StrataModel, StrataSim, StratWorks, StratWorks 3D, StreamCalc, StressCheck, STRUCT, Structure Cube, Surf & Connect, SurfNet, SynTool, System Start for Servers, SystemStart, SystemStart for Clients, SystemStart for Servers, SystemStart for Storage, Tanks & Tubes, TDQ, Team Workspace, TERAS, T-Grid, The Engineer's DeskTop, Total Drilling Performance, TOW/cs, TOW/cs Revenue Interface, TracPlanner, TracPlanner Xpress, Trend Form Gridding, Trimmed Grid, Turbo Synthetics, Unconventional Essentials, VESPA, VESPA+, VIP, VIP-COMP, VIP-CORE, VIPDataStudio, VIP-DUAL, VIP-ENCORE, VIP-EXECUTIVE, VIP-Local Grid Refinement, VIP-THERM, WavX, Web Editor, Well Cost, Well H. Clean, Well Seismic Fusion, Wellbase, Wellbore Planner, Wellbore Planner Connect, WELLCAT, WellDirect, WELLPLAN, WellSolver, WellXchange, WOW, Xsection, You're in Control. Experience the difference, ZAP!, ZetaAnalytics, and Z-MAP Plus are trademarks, registered trademarks, or service marks of Halliburton..

All other trademarks, service marks and product or service names are the trademarks or names of their respective owners.

Note

The information contained in this document is subject to change without notice and should not be construed as a commitment by Halliburton. Halliburton assumes no responsibility for any error that may appear in this manual. Some states or jurisdictions do not allow disclaimer of expressed or implied warranties in certain transactions; therefore, this statement may not apply to you.

Third Party Licenses and Attributions

Halliburton acknowledges that certain third party code has been bundled with, or embedded in, its software. The licensors of this

third party code, and the terms and conditions of their respective licenses, may be found at the following location:

[InstallationDirectory]\Documentation\Third_Party.pdf

Disclaimer

The programs and documentation may provide links to external web sites and access to content, products, and services from third parties. Halliburton is not responsible for the availability of, or any content provided on, third party web sites. You bear all risks associated with the use of such content. If you choose to purchase any products or services from a third party, the relationship is directly between you and the third party. Halliburton is not responsible for: (a) the quality of third party products or services; or (b) fulfilling any of the terms of the agreement with the third party, including delivery of products or services and warranty obligations related to purchased products or services. Halliburton is not responsible for any loss or damage of any sort that you may incur from dealing with any third party.

Contents

Migration of Data—An Overview 1
MAP - MIGRATE - MERGE 1
Recommended Migration Sequence 6
Known Issues 7

DIMS Pre-Transfer Preparation - QA 9
Overview 9
Preparation of Storage Units 10
Steps for DIMS Data - Pre-Migration 15

Drilling Field Mapping 49
Overview 49
Purpose 51
Using the Tool 52
The Field Mapping Tool Window 52
Source Database Area 52
EDM Database Area 53
Mapping Properties Area 53
Viewing Migration SQL 56
Main Menubar Commands 57
Procedures 59
Mapping Sets 59
View Current Mapping Set 59
Export the Mapping Set 61
Copy a Mapping Set 62
Rename a Mapping Set 63
Create a New Mapping Set 65
Add Mappings to Mapping Set 67
Remove Mappings from a Mapping Set 69
Run Pre-Migration SQL or JQL Scripts 70
Run Post-Migration SQL or JQL Scripts 71

Drilling Data Migration 73
Overview 73
Data Migration Preparation 74
DIMS Pre-Transfer Preparation - QA 75
Data Migration Purpose 76
The Data Migration Tool 76

Using the Tool. 79
The Migration Tool Window 79
Application Setup 79
The Database Connections 82
Log 84
Start Data Transfer 85
Main Menubar Commands 85
Start Data Transfer 90
Procedure—Data Migration 94
Procedure—Transfer of Data for Multiple Databases 105
Migration of DIMS Custom Configuration 106
Users/Security 106
Picklists and Picklist Configuration 106
Custom Field Security 106
Optional Labels 107
Extra Notes 107
Carryover 107
Known DIMS to EDM Unit Conversion Issues 108
Troubleshooting 112
Data Migration Troubleshooting 112
Potential Overflow Scenario 112
Isolated Migration of Specific Tables 112

EDM Data Merging 115
Overview 115
Purpose 116
Migrating Tubular Data 117
Using the Tool 119
The Data Merging Tool Window 119
Manual Tab 120
Automatic Tab 121
Merge Button 121
Main Menubar Commands 122
Procedure 124
Using the Manual Tab 125
Using the Automatic Tab 127
Scenario One - Copying a Project 127
Scenario Two - Same Well Different Names 128
Scenario Three - Same Well and Wellbore 132
Deleting a Business Object 136

Copy Legacy Files 137

COMPASS Post Migration Steps 139
Overview 139
Differences Found in a Well Coordinates Comparison 140
Surface Location Differences 140
Large Bottom Hole Depth and Location Differences (1000's of ft/m) 140
Medium Bottom Hole Location Differences (10-100's of ft/m) 141
Small Bottom Hole Location Differences (<10'/m) 142
Errors in Migration to be Fixed in a Future Release of COMPASS 2003. 142
Tying onto Definitive Paths 143
Differences in Wellpaths Bottom Hole Locations 143
Differences in Error Ellipsoid Dimensions 144
Incomplete migrations from Legacy systems. 144
Comparing COMPASS Releases 2000 vs. 2003 and Higher Data 145
Preparation - Before Running the Well Coordinates Files Check the following: 145
Generating the Well Coordinates Files 145
Other things to note… 149
Custom Geodetic Systems 149
Errors in Data Migration 150
Errors in Post Migration Processing in COMPASS 150

Appendix A: Configuring the Data Migration Toolkit 153
Overview 153
Oracle 154
Create the Staging Area User 154
Grant Roles to the Staging Area User 155
Grant DBA Role to the EDM User 155
Add Custom Stored Functions 156
MSDE and Microsoft SQL Server Express 2005 157

Appendix B: Mapping Sets 159
Overview 159
Modifications to the DIMS Mapping Set 160

Appendix C: Unit Conversion Tables 161
Overview 161
FDD_UNIT_MEASURES Table 162
UMS_SYS_UNIT_MEASURES Table 179

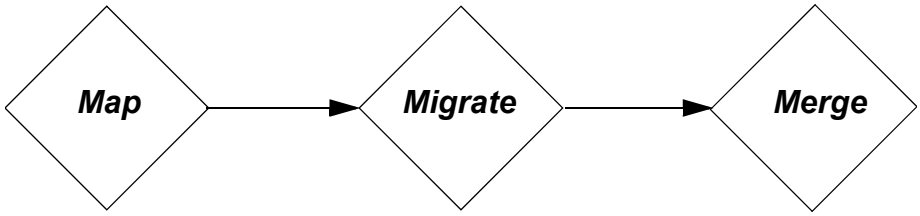
Appendix D: Support Locations 201
Contacting Support 201

Migration of Data—An Overview

MAP - MIGRATE - MERGE

The steps in the migration of data from legacy Landmark Drilling and Well Services databases to the EDM™ database are critical to the integrity of the resultant EDM data set that is created from the migration process. DIMS™, COMPASS™, and WELLPLAN™ data is handled by the Data Migration Toolkit. (StressCheck™ and CasingSeat™ data can be imported within those applications when running against the EDM database.) The migration of legacy DIMS, COMPASS, and WELLPLAN data to the EDM database is a three-step process:

- Mapping of fields,
- Migration of data, and
- Merging of data.



The Data Migration Toolkit has been developed for each of the three steps in the data migration process to enable clients to migrate DIMS, COMPASS, and WELLPLAN databases to the EDM database. This toolkit contains the following three tools:

- **Drilling Field Mapping**

  This tool allows the client implementation team to map equivalent fields from the legacy database to the EDM database. Complete mappings of DIMS, COMPASS, and WELLPLAN data are provided with the Engineer's Desktop release. See "Drilling Field Mapping" on page 49.

- **Data Migration**

  This tool is used to migrate data from the legacy databases to the EDM database once the field mappings have been verified. See "Drilling Data Migration" on page 73.

- **EDM Data Merging**

  The final step in the process, data merging, is performed to reduce duplicate business objects in the EDM database created during the data migration process. This step becomes increasingly important if more than one database was migrated, particularly from different applications. See "EDM™ Data Merging" on page 115.

Note:

If more than one user tries to migration the same database simultaneously, a warning will appear.

Prior to the release of the EDM database, the DIMS, COMPASS, WELLPLAN, CasingSeat and StressCheck applications stored data in separate application data stores. The DIMS, COMPASS, and WELLPLAN stored data in relational databases [e.g., DIMS a7_data.mdb (Oracle or SQL server); COMPASS CFW.DB -SQL Anywhere or Oracle database; WELLPLAN WELLPLAN.MDB Microsoft Access database]. CasingSeat and StressCheck (known as Tubulars applications) stored data in flat files on the hard drive of the computer on which the software application was used (e.g., CasingSeat.PDI and StressCheck.SCK).

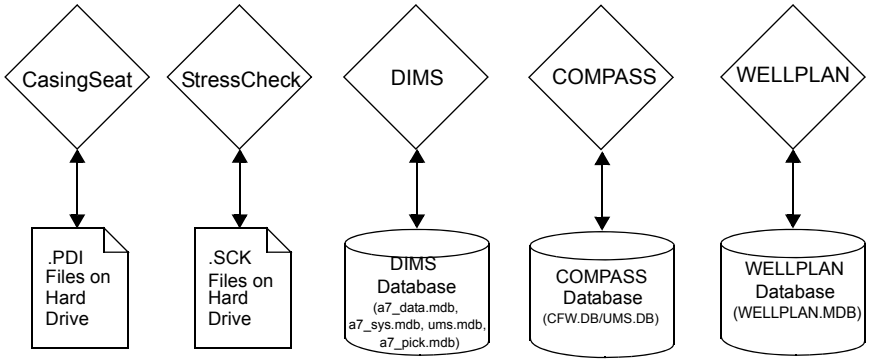


Figure 1: Data from DIMS, COMPASS, WELLPLAN, CasingSeat, and StressCheck software before migration of data to EDM has taken place.

The migration of data from DIMS, COMPASS, and WELLPLAN applications to the EDM database places all of the data into the same EDM data source. The EDM Data Merging tool must then be used to merge common data that existed between the three application data sets (e.g. Company, Project, Site, and Well).

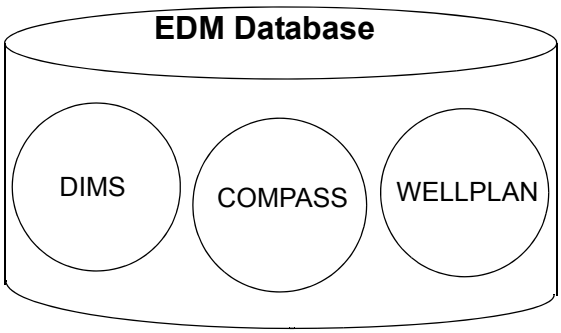


Figure 2: Data from DIMS, COMPASS, and WELLPLAN applications after using Drilling Data Migration.

The EDM Data Merging tool allows the client implementation team to merge common data for the applications migrated.

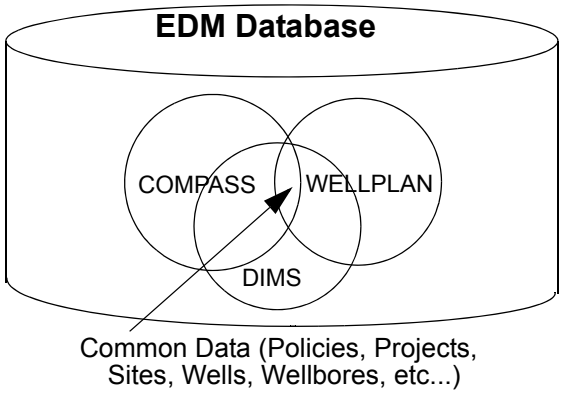


Figure 3: Data from DIMS, COMPASS, and WELLPLAN applications after using EDM Data Merging.

Once the data is located in the EDM database, all applications included in the Engineer's Desktop release will be able to access data from this single location. CasingSeat and StressCheck applications allow legacy flat file data sets to be imported into the EDM database inside the applications. Once imported, these data sets can be moved or merged using tools available in the Well Explorer (a data management browser common to all applications), or by using the EDM Data Merging tool.

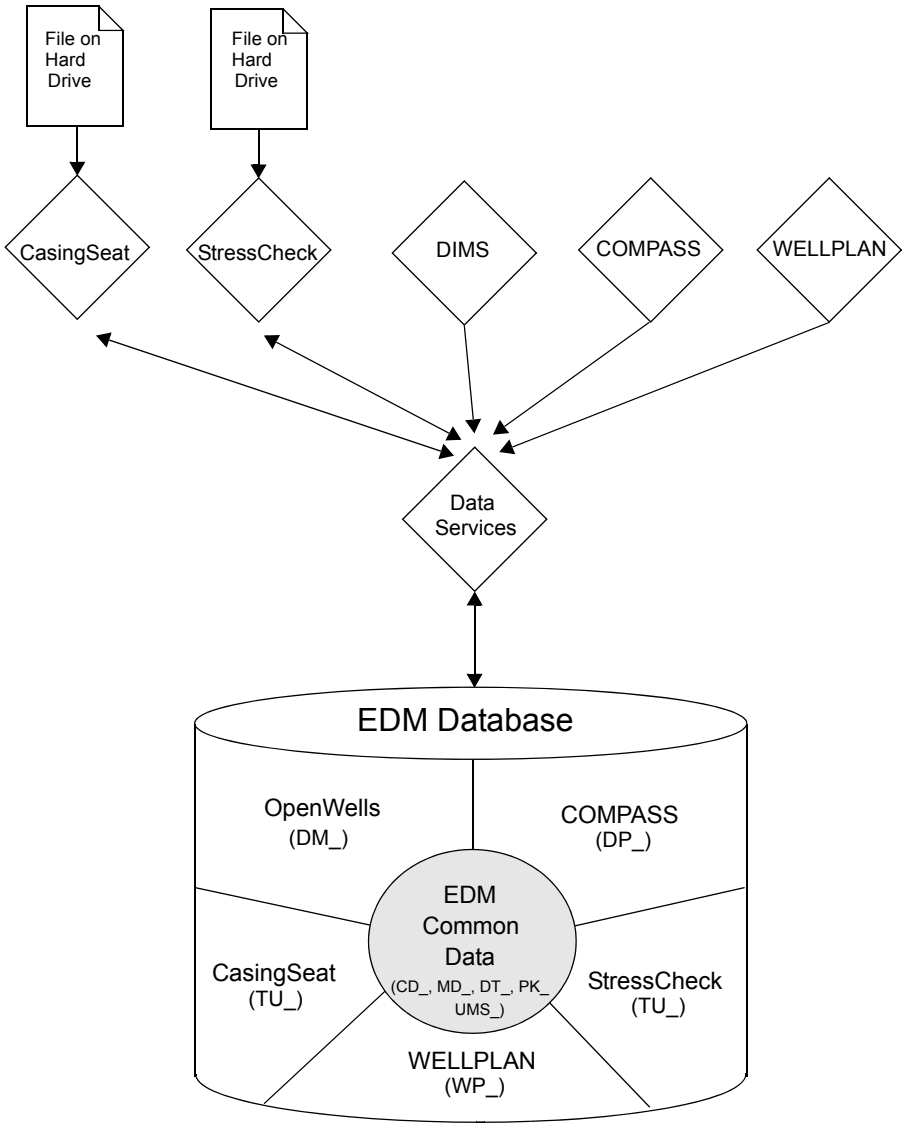


Figure 4: OpenWells, COMPASS, WELLPLAN, CasingSeat and StressCheck applications using the EDM Database

The EDM database is a mix of common data tables (e.g. CD_XX), common infrastructure tables (e.g. MD_, DT_, PK_) and application-specific tables (e.g. DM_, DP_, TU_, WP_). The common data tables allow the applications to naturally integrate through sharing of a single data hierarchy and common data such as assemblies and formation tops. Data required for just one application is stored within dedicated application data tables (e.g. TU_XXX stores Tubulars-specific data).

All applications communicate with the EDM database through data handler layers. Most commonly, the EDM Data Services toolkit developed by Landmark is used. Data Services handles all of the select, insert, update, and delete transactions required by the applications and also provides for Import and Export of data migration files using XML as the data definition language.

The EDM database itself may be a stand-alone SQL Server 2005 Express database or a networked Oracle Enterprise database. The Engineer's Desktop™ installation includes a SQL Server 2005 Express database. Clients must construct their own Oracle database using scripts provided by Landmark. See the *EDT Drilling Installation Guide*, which can be found in the Windows Start menu: **Start > Programs > Landmark Engineer's Desktop 5000.1 > Documentation > User Guides**.

Recommended Migration Sequence

Landmark recommends the following migration sequence for multiple application migrations:

- migrate COMPASS database(s) to EDM database,

> **COMPASS Program Post-Migration**
>
> Verify that the COMPASS 2000 database has been backed up prior to running the migration. COMPASS 2000 data is required for comparison against the migrated data (COMPASS 2003) in the "COMPASS™ Program Post Migration Steps" on page 139.

- migrate WELLPLAN database(s) to the EDM database,
- use the Data Merging tool to remove duplicate structures for both COMPASS and WELLPLAN data sets,
- migrate DIMS™ database(s) to the EDM database,

> **Note:**
>
> Drilling Data Migration now enables the migration of DIMS wells in stages. See "Options > Advanced..." on page 86.

- use the Data Merging tool to remove duplicate structures for DIMS data sets,
- import StressCheck data, through the Engineer's Desktop application's File > Import... menu command,
- import CasingSeat data, through the Engineer's Desktop application's File > Import... menu command,
- Run the "COMPASS™ Program Post Migration Steps" on page 139,
- use the Well Explorer - copy, paste method to clean up data sets, or use the Data Merging tool to resolve duplicates.

Known Issues

1. Company and User logos from the COMPASS W2000 software are not migrated to the EDM database and therefore must be manually added once the migration is complete using Company Properties.

2. DIMS Output Report logos are not migrated to the EDM database and therefore must be manually added once the migration is complete.

3. COMPASS lithologies are not migrated to the EDM database; instead they are mapped to a default set of lithologies shipped with the Engineer's Desktop software. This will mean that any custom lithologies created in COMPASS W2000 software will not be migrated and must be re-created.

> **Note:**
>
> The default set of EDM lithologies that are shipped with the EDM database do not have bitmaps associated with them. When a EDM database is first opened in the COMPASS or OpenWells applications, users should assign bitmaps to lithologies using the Lithology Editor. Users are free to use any bitmaps, but a default set of bitmaps is provided in the EDT\Common Files\Images folder.

4. Custom geodetic models (.GDF files) from the COMPASS software are not migrated to the EDM database. The EDM database has been pre-populated with all known .GDF files. If a file is missing use the **Load Geodetic System File** button found in the COMPASS 5000.1 Geodetic Calculator.

5. Landmark did not attempt to modify the filter criteria for the DIMS custom picklist migration. This must be done manually by the client, post migration.

6. Each user running the Data Migration Tool on Oracle must run the SQL script java_stored_procedures_ENTERPRISE.SQL on Oracle. If the script is not run prior to the migration, errors are generated and the data migration will not be successful.

7. The Data Merging Tool must be used on a machine with at least 400 MB of memory to support the maximum heap size set by the Javaw interpreter option "-Xmx200M".

8. Citrix: Error generated in Citrix environment when migrating data (COMPASS For Windows import). Workaround: Assign read/ write rights to the data transfer properties file on the Citrix server.

DIMS™ Data Pre-Transfer Preparation - QA

Overview

In order to ease the migration of DIMS™ data, it is important to take steps prior to the migration step to clean up data in the DIMS database and ready it for the data migration. The following sections describe a number of procedures that should be performed by the DIMS software System Administrator prior to the migration of data.

Preparation of Storage Units

Before any other pre-transfer preparation steps are undertaken, the DIMS data storage units must be reviewed. The UMS.MDB for DIMS software is an Access database used solely by the data migration utility. It is installed during the Engineer's Desktop 5000.1 software installation into the EDT_5000.1\EDM\Data Migration\Lib directory. It contains tables used during the migration of the data to ensure that correct DIMS to EDM unit conversions are performed.

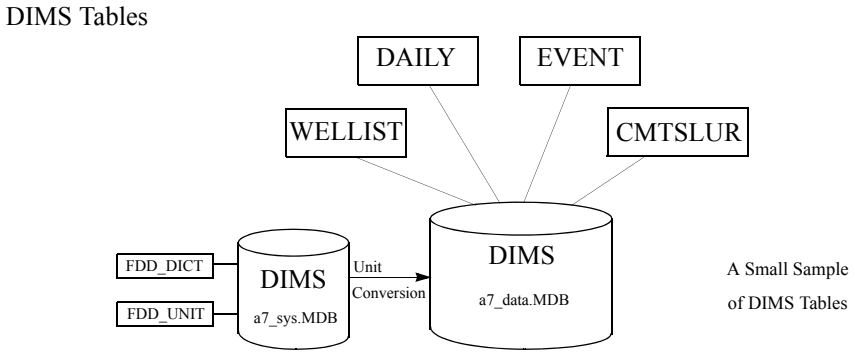


Figure 1: Behavior of Data with Units Associated in DIMS software.

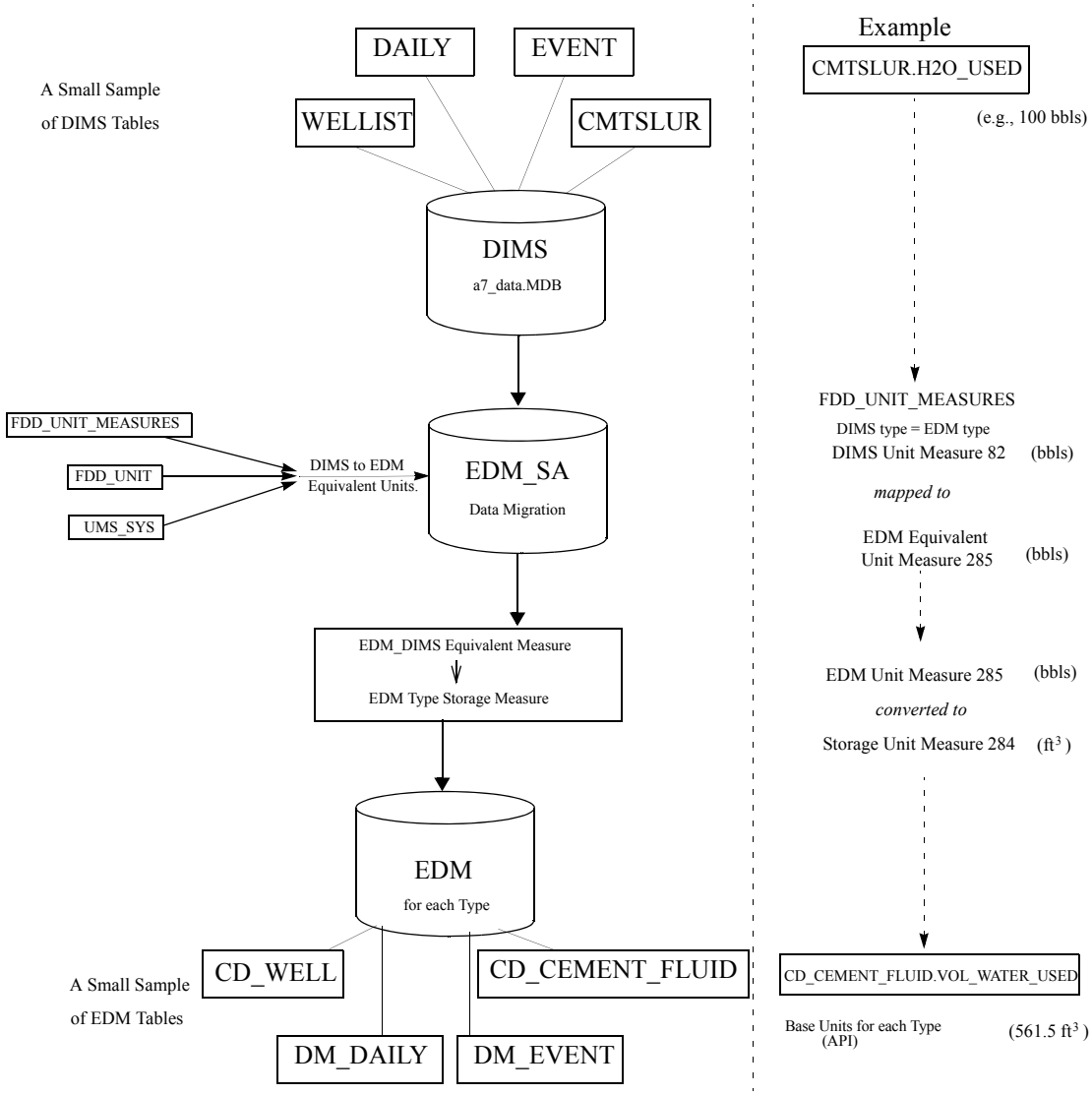


Figure 2: Data Migration Unit Handling from DIMS database to EDM database.

The tables contained within UMS.MDB are:

- FDD_DICT
- FDD_UNIT_MEASURES
- FDD_UNIT
- UMS_SYS_UNIT_MEASURES

The UMS_SYS_UNIT_MEASURES table can be used by the client to see all the available EDM measure IDs. It is a copy of the

UMS_SYS_UNIT_ MEASURES table included in the EDM database release.

The FDD_UNIT_MEASURES table contains a mapping of the storage units used in the DIMS database to the equivalent units in the EDM database. It is initially populated to support the unit sets created by Landmark (API, SI) for all default unit types provided with DIMS software. In the case of custom unit set names, the database administrator will determine the most appropriate selection of DIMS storage units for the Data Migration procedure. The following table details the default DIMS unit set with the DIMS to EDM unit conversion set to use for the data migration.

DIMS Unit Set Name	Selection for Data Migration
API to API	API
API to SI	SI
SI to API	API
SI to SI	SI
MIXED to API	API

If custom DIMS unit sets have been created (or an existing unit system has been changed), then the contents of the FDD_UNIT_MEASURES table must be revised and updated to ensure that all DIMS storage units are mapped to appropriate EDM unit measures.

Note:

FDD_UNIT_MEASURES table does not determine the actual storage units in the EDM database. The FDD_UNIT_MEASURES table simply defines an EDM measure_id that is equivalent to the DIMS unit type. It will be used when reading the DIMS data so that a unit conversion can be performed during the Data Migration to correct values to EDM storage units.

Prior to the migration of data, consistent storage units must be established in the DIMS database. The migration of the DIMS data is based on the assumption that all data in the DIMS database being migrated is stored consistently in one storage unit set. For example: “API to API” and “SI to API” are both “API” storage units, and “SI to SI” and “API to SI” are both “SI” storage units. It is normal for a DIMS database to use a single storage unit. For example, if the current unit system is “API to API”, then “XX to API” is also a valid unit system for a single storage unit, but “XX to SI” is not.

For mixed base unit systems, special steps must be taken for the preparation of the DIMS data for migration. If your system includes mixed storage base units, please contact Landmark Graphics Corporation for assistance in preparing the data.

If a DIMS database contains multiple storage units (e.g., some wells have API storage units and other wells have SI storage units), then the data must be migrated separately using the correct unit mapping set. The end result is a single EDM data set stored consistently to EDM base units.

There is a requirement that all DIMS storage units are mapped to a unit measure found in the EDM UMS_SYS_UNIT_MEASURES table. The FDD_UNIT_MEASURES table maps the DIMS 'unit_type' to an EDM 'measure_id'. If a custom unit-type has been created by the client (i.e. unit_type>=1001) the equivalent measure_id will not be listed in the MD_SYS_UNIT_MEASURES table. Therefore, a custom unit measure must be created in EDM's MD_SYS_UNIT_MEASURES table. The custom unit_type must be greater than 1000 and match that from the DIMS database.

The unit conversion reads the data in the terms of the measure_id associated with a given unit_type and then determines whether or not a particular field needs to be converted based on its unit type in the DIMS software and the measure_id of the field it's mapped to in the EDM database. For example, both unit types 13 and 14 are depths in DIMS. They are mapped to EDM measure_id 121 for SI and 122 for API. The field DAILY.depth in the DIMS software is mapped to DM_DAILY.md_current in the EDM database. The storage unit defined in the EDM database for that field is 122. Because data is migrating from measure_id 122 to a measure_id 122, no unit conversion is necessary for that field. Given the same scenario, assuming the base DIMS storage units are SI, the conversion program needs to convert the data from a measure_id 121 to a measure_id 122. The conversion will use the multiplier associated with measure_id 121 (which is 3.280839895) and multiply the values in the database for that field by that factor, thus converting DAILY.depth values from meters in the DIMS software to feet in the EDM database.

To determine if there are custom units in the DIMS software, look in the FDD_UNIT table in the A7_SYS.MDB for any units with a unit_type greater than 1000—these are custom units. Review these unit instances. Each of these will need to be added to UMS.MDB in the FDD_UNIT_MEASURES table, assigning the custom unit type to a valid measurement class in EDM for both API and SI base unit sets. To see the EDM measurement classes, view the contents of the

UMS_SYS_UNIT_MEASURES table. The measure_id field will be the field that is mapped to the DIMS FDD_UNIT.UNIT_TYPE. When reviewing DIMS to EDM unit conversion and field mappings, it is important to ensure that the DIMS to EDM mapped unit measure is valid for the EDM data field to which the DIMS data is being migrated. The data field in DIMS and the data field in EDM must be the same type of measure. For example, fields that are recorded in barrels in DIMS are recorded in ft^3 in EDM, and they are both measures of volume.

Also contained in UMS.MDB, the DIMS standard data dictionary table (FDD_DICT) is available. The client should replace that FDD_DICT with their own if they've configured DIMS fields to use custom units, or have changed fields to use a different unit type than the ones provided with DIMS.

For instance, if the client determines they have created a unit type in DIMS with the unit ID of 1001 and its unit is gal/sack for API and m3/sack for SI, the following lines should be added into FDD_UNIT_MEASURES table.

Unit_Set	Unit_Type	Unit_Store	Measure_ID
API	1001	gal/sack	267
SI	1001	m^3/sack	265

By reviewing UMS_SYS_UNIT_MEASURES, it was determined that measure_ids 265 and 267 matched the description for which we were searching, both were in the same type_id of 50 (it is imperative that the API and SI unit equivalent pairs are in the same type_id in order for conversion to happen correctly).

Only after all issues have been resolved concerning the storage units for DIMS can the other steps for preparing the DIMS data be undertaken.

Steps for DIMS Data - Pre-Migration

The following steps must be taken prior to starting the migration of DIMS data to EDM format. A number of Data Analyzer Queries have been provided by Landmark as a tool to check DIMS legacy data. These queries must be run using the Data Analyzer application. Each of the steps is described in detail following the list.

1. Identify orphan data
2. Clean up rig and rig equipment data
3. Clean up time values
4. Clean up BHAs, component ordering, tool types, grade, and material
5. Identify any bits not associated with a BHA
6. Group ‘like’ mud products together
7. Group ‘like’ bulk products together
8. Create Policies and Projects
9. Ensure offshore Wells are marked with the offshore flag
10. Ensure all Wells belonging to the same platform or pad can be grouped together
11. Ensure that all Wells were entered with the same reporting standard and using the same reporting time
12. Ensure perforated assembly name has a value that matches one of the assemblies in the Well if possible
13. Convert daily holesize records to use the hole section table if necessary
14. Ensure Pool Names and Formation Names are consistent.
15. Ensure Support Craft Items are consistent within a given Well
16. Ensure the Personnel Records are consistent within a given Well and Event

17. Ensure Kick-Off Dates for Sidetracks are complete and correct; ensure Start Dates and End Dates for Events are complete and correct

18. Ensure that the Last Casing/Next Casing Size Records are valid and consistent from day-to-day within an Event

19. Ensure consistent measurement points in Datums and correct Reference Depth Elevations

20. Ensure RDL Flags are Removed for RDL the values DAILY.pitdepth and DAILY.pit_tvd

21. Ensure that the new SYSINFO parameters being used by the Migration Toolkit are present

22. Look for blank or invalid keys in DAYCOST

23. Ensure all Sidetrack Records are numbered and assigned a Parent Sidetrack

24. Change Zero values to NULL

25. Check Lithology mappings and use of the PK_GROSLITH picklist

26. Check Logging Intervals information / services format

27. Ensure Casing and Wellbore Equipment components picklist in EDM match the DIMS Component Group Name

28. Check DST Flow Rates and Flow Period Redesign

29. Ensure CD_SURVEY_TOOL table exists

30. Ensure there are no blank Report dates in Daily Reports

31. Ensure each Survey has a Tie-in Point and that it is at the minimum Depth for that Survey run.

32. Ensure the “R” flag is removed fro the FDD_DICT table if RDL was used in the DIMS software

1. Identify Orphan Data

There are a number of instances where records have the potential of being orphaned in the DIMS software; during a failed transmission, improper shutdown of DIMS software, or due to data alteration outside of the application. Orphaned data in a child table is no longer referenced to its parent table, and as a result no application (including DIMS) can access the orphaned record using relational SQL.

In order to aid in the detection of orphan data, two scripts are provided for use on Oracle legacy DIMS databases: *orphanfinder.ora* and *orphankiller.ora*. Orphanfinder.ora will identify orphan records and spool off the keys to a file. Orphankiller.ora will delete orphan records from the database. It is recommended that the orphans are identified using orphanfinder.ora, and then the records are investigated and deleted where necessary. The scripts can be found in the Engineer's Desktop 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials.

2. Clean Up Rig and Rig Equipment Data

Rigs

In DIMS software, Rig records were duplicated every time the Rig was moved onto a new well. In EDM software, each physical Rig and its corresponding equipment will be listed only once, and then associated with events and reports as needed.

As a result of the duplication of Rigs and Rig Equipment in DIMS software, pre-migration processing is necessary to obtain unique records ready for the CD_CONTRACTOR table, the CD_RIG table and all of the children of the CD_RIG table in EDM software. All new keys will also be cascaded into their associated operations records (e.g., PumpOps and Daily).

Contractors and Rigs

It is also important to clean up the contractor name field information in DIMS software. Run the *DistinctContractorInfo.daq* query, which provides a distinct list of CONTR_NAME from RIGS. Scan the query results to identify any duplicates with different spellings and values, and make corrections where necessary. The *DistinctContractorInfo.daq* Data Analyzer query can be found in the EDM Engineering 5000.1

download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

In EDM software the parent table for Rig information is CD_CONTRACTOR, thus it is advisable that **no** DIMS Rig records have a Null CONTR_NAME field. In case some null values are missed, the CONTR_NAME field will be populated with "*No Contractor Given*" during the pre-migration process.

The *DistinctContractorInfo.daq* query should also be run which provides a distinct listing of the CONTR_NAME, RIG_NAME, RIG_NO, and RIG_TYPE fields. Scan the query to identify any obvious duplicates and mistakes. Make changes as necessary to finish preparing the contractor and rigs data for the migration. The *DistinctContractorInfo.daq* Data Analyzer queries can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Contractor Name	RIGS	CONTR_NAME
Rig Name	RIGS	RIG_NAME
Rig Number	RIGS	RIG_NO
Rig Type	RIGS	RIG_TYPE

Additional Contractor records are generated in post-migration based on the contractor names in the DIMS Well Planning Report, if they did not already exist in CD_CONTRACTOR. A client should ensure that the contractor names in Well Planning match those in Rigs if they are in fact the same (i.e. H&P Drilling vs. Helmrich & Payne Drilling) should be cleaned up to be consistent.

Rig Equipment

Data Analyzer queries have been provided to assist with the grouping of distinct data on the fields which are grouped in the pre-migration script. The following queries can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file: *DistinctPumpInfo.daq*, *DistinctCentrifuge.daq*, *DistinctHydrocloneInformation.daq*, and *DistinctShaker.daq*.

Pumps

In the EDM database, pump equipment will be grouped by NEW_RIG_ID (the field constructed in the previous step which groups like rigs together), PUMP_NO, PUMP_MAKE, PUMP_MODEL, PUMP_CYL, PUMP_STRK, PUMP_ROD, and PUMP_TYPE. A query should be run against legacy DIMS data. Use the result to clean up the pump fields that are obviously the same (i.e., P-12-160 vs. P12-160) allowing 'like' equipment to be merged together within the same rig.

Enter data for all NULLS at this time where it is available.

Find and correct any orphaned records. For example, if there are rows in PUMP with a RIG_KEY that does not exist in the RIGS table, or there are rows in PUMPOPS with a PUMP_KEY that does not exist in PUMP, these update statements will fail; failing motivates the user to locate and clean up the orphaned records (which should have been found during step 1 when orphan data is identified).

Critical DIMS Field Name	Database Table Name	Database Column Name
(not shown in DIMS software)	PUMP	RIG_KEY
(not shown in DIMS software)	PUMPOPS	PUMP_KEY
Make	PUMP	PUMP_MAKE
Model	PUMP	PUMP_MODEL
No	PUMP	PUMP_NO
Rod	PUMP	PUMP_ROD
Stroke	PUMP	PUMP_STRK
Cylinder	PUMP	PUMP_CYL
Type	PUMP	PUMP_TYPE

Hydrocyclones

Hydrocyclone equipment will be grouped by NEW_RIG_ID (the field constructed in the previous step which groups 'like' rigs together), CLONE_NO, CLONE_MAKE, CLONEMODEL, CLONE_TYPE, CLONECONES, and CONE_SIZE. A query should be run against the legacy DIMS data. Use the result to resolve the hydrocyclone fields that are obviously the same (i.e., De-silter vs. Desilter) allowing 'like' equipment to be merged together.

Enter data for all nulls at this time where it is available.

Critical DIMS Field Name	Database Table Name	Database Column Name
(not shown in DIMS software)	HYDCLONE	RIG_KEY
(not shown in DIMS software)	CLONE_OP	CLONE_KEY
Hydroclone Number	HYDCLONE	CLONE_NO
Hydroclone Make	HYDCLONE	CLONE_MAKE
Hydroclone Model	HYDCLONE	CLONEMODEL
Hydroclone Type	HYDCLONE	CLONE_TYPE
No Cones	HYDCLONE	CLONECONES
Cone Size	HYDCLONE	CONE_SIZE

Centrifuges

Centrifuge equipment will be grouped by NEW_RIG_ID (the field constructed in the previous step which groups like rigs together), CENT_NO, CENT_MAKE, CENT_MODEL, and CENT_TYPE. A query should be run against the data. Use the result to clean up the centrifuge fields that are obviously the same (i.e., S3-0G vs. S30G) allowing ‘like’ equipment to be merged together.

Enter data for all nulls at this time where available.

Critical DIMS Field Name	Database Table Name	Database Column Name
(not shown in DIMS software)	CENTRIFG	RIG_KEY
(not shown in DIMS software)	CENT_OPS	CENT_KEY
Centrifuge No	CENTRIFG	CENT_NO
Centrifuge Make	CENTRIFG	CENT_MAKE
Centrifuge Model	CENTRIFG	CENT_MODEL
Centrifuge Type	CENTRIFG	CENT_TYPE

Shakers

Shaker equipment will be grouped by RIG_ID (the field constructed in the previous step which groups ‘like’ rigs together), SHKR_NO, SHKR_MAKE, SHKR_MODEL, SHKR_TYPE, SHKR_LEVEL. SHKR_LOC, and SHKR_DECKS. A query should be run against the data. Use the result to clean up any shaker fields that are obviously the same (i.e., ALS2 vs. ALS-2) allowing ‘like’ equipment to be properly merged together.

Enter data for all nulls at this time.

Ensure that all shaker level fields (SHAKERS.shkr_level) are in the value range between 0 and 9.

Ensure that all shaker decks (SHKRSCRN.shkr_deck) have a valid value.

Critical DIMS Field Name	Database Table Name	Database Column Name
(not shown in DIMS software)	SHAKER_OPS	SHKR_KEY
(not shown in DIMS software)	SHAKERS	RIG_KEY
Shaker No	SHAKERS	SHKR_NO
Shaker Make	SHAKERS	SHKR_MAKE
Shaker Model	SHAKERS	SHKR_MODEL
Shaker Type	SHAKERS	SHKR_TYPE
Shaker Level	SHAKERS	SHKR_LEVEL
Shaker Location	SHAKERS	SHKR_LOC
No. of Decks	SHAKERS	SHKR_DECKS

3. Clean Up Time Values

In the DIMS database there are several time fields that are not date/time data types in the database. Instead, these fields allowed for textual data entry which may cause date-time conversion errors during the migration to the EDM database. All DIMS time stored in text data type fields are linked with their associated date field and converted to a date/time field in the EDM database. To enable the conversion of these time fields, all time fields should be reviewed for valid entries. Search for values such as ‘:00 ’, ‘00-00’, ‘30min’ or any value which does not have a colon (:) in position three, as this will indicate an invalid time field. All values which are equal to ‘__:__’ and have a non-null

matching date will be converted to ‘00:00’. All those with a null matching date will be set to null.

Two Data Analyzer queries, *OperationTimesTooGreat.daq* and *ReportingTimevsOperationTimes.daq,* have been provided to assist with the cleanup of time values. They can be found on the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Recommended SQL queries to run against all time fields:

- SELECT time_start from GEN_PERF where not (substring(time_start,3,1))=’:’;
- SELECT time_start from GEN_PERF where (substring(time_start,1,2))<‘00’ or (mid(time_start,1,2)) >’23’;
- SELECT time_start from GEN_PERF where (substring(time_start, 4, 2)) < ‘00’ or (mid(time-start, 4, 2)) > ‘59’;

The following query will aid in identifying time fields in the DIMS database. This is run against the Data Dictionary in A7_SYS.MDB field. Access database file:

- SELECT table_name, field_name from FDD_DICT where flags like ’*T*’.

This query yields the following results from a Landmark sample database. Not all system will have been configured the same way, so a given DIMS system may yield more or less rows. There may be time fields that need investigation which were not marked as “T” fields in a DIMS system.

table_name	field_name	table_name	field_name
BHAGEN	TIME_IN	PUMPOPS	RECD_TIME
BHAGEN	TIME_OUT	RIGMOVE	ANCH_TIME
BHAOPS	CHECK_TIME	RIGMOVE	ARRIVETIME
BITOPS	RUNTIME	RIGMOVE	COMP_TIME
BITS	TIME_IN	RIGMOVE	PIN_TIME
BITS	TIME_OUT	RIGMOVE	PLOAD_TIME
CENT_OPS	RECD_TIME	RIGMOVE	RIG_REC_TM
CLONE_OP	RECD_TIME	RIGMOVE	START_TIME
CMTSTAGE	END_PUMP	RIGMOVE	UNDER_TIME
CMTSTAGE	START_DISP	RIGOPS	FINDRLGTME
CMTSTAGE	START_SL	RIGOPS	RIG_OF_TME
CMTSTAGE	TIME_END	RIGOPS	RIG_PU_TME
CMTSTAGE	TIME_START	RIGOPS	RIG_UP_TME
DAILY	REPTIME	RIGOPS	RIGCHRGTM
DECKRMKS	DTIME	RIGOPS	RR_TIME

DSTFLOW	STARTTIME	RIGOPS	STRTDRL_TM
FLOWTIME	ENDTIME	SHAKEROP	RECD_TIME
FLOWTIME	STARTTIME	STIMSTG	TIME_END
GEN_CMT	REC_END	STIMSTG	TIME_START
GEN_CMT	REC_START	SUPPORT	ARRIVAL
GEN_CMT	ROT_END	SUPPORT	DEPARTURE
GEN_CMT	ROT_START	SURVEYS	REPT_TIME
GEN_DST	ONBOTTOM	TESTFLOW	TEST_TIME
GEN_DST	OUTOFHOLE	TESTSWAB	SWAB_TIME
GEN_DST	PULLDLOOSE	TRANSFER	TRAN_TIME
GEN_DST	STARTIN	VESMOVE	ARR_TIME
GEN_GEO	REPT_TIME	VESMOVE	REL_TIME
GEN_LOG	BEGIN_CIRC	VOYAGE	ETA_TIME
GEN_LOG	BIT_OUT	VOYAGE	VTIME
GEN_PERF	F_SURF_TM	WEATHER	TTIME
GEN_PERF	TIME_END	WELLIST	CRDO_TIME
GEN_PERF	TIME_START	WELLIST	SPUD_TIME
GEN_PRES	SI_TIME		
GEN_STIM	TIME_END		
GEN_STIM	TIME_START		
GEN_TRAN	TRAN_TIME		
GEN_WEQP	TIMEINHOLE		
GEN_WEQP	TIMELANDED		
MUDCHECK	OIC_TIME		
MUDCHECK	REPT_TIME		
OPSUM	OP_FROM		
OPSUM	OP_TO		
PLANOPS	STARTTIME		

4. Clean Up BHAs (Component Ordering, Tool Types, Grade, and Material)

Preparation of BHA data (component ordering, tool types, grade, and material) is required prior to conversion to the EDM database. Both grade and material data are applicable for BHAs, Casings, and Wellbore Equipment strings.

Component Ordering

Ensure that all component lists for BHAs are input in the same order, either top down or bottom up. If not, select one order and modify those BHAs that don't match that standard. If a component has a large number of BHAs entered both ways, Landmark recommends that the Wells are split into different DIMS migration databases and migrated separately.

The data analyzer query, *BHAComponentOrder.daq* has been provided to aid in this step of the pre-preparation transfer of DIMS data. The query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Tool Types

Fill in blank tool types (tool_type) and section types (sect_type), as these will be converted to proper equivalents in the EDM database for matching with system picklist tables. The standard BHA Component picklist can be used as a guide for the entries used by your company. In the field mappings, a user can view the substitute clause associated with BHACOMP.sect_type and make additional necessary entries to match all section types used in the company system. (See “View Current Mapping Set” on page 59).

The data analyzer query, *BHAComponentWithoutASectTypeCode.daq* has been provided to aid in this step of the pre-preparation transfer of DIMS data. The query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Jars and NDCs

Data Migration assumes that there is one Jar per assembly and one NDC per assembly. The Data Analyzer queries, *BHAAssemblieswithmorethan1NDC.da*q and *BHAAssemblieswithmorethan1jar.daq* identify when more than one Jar and NDC per assembly is present.

These query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Grades and Materials

In the EDM database, grades and materials are not simple text; they are driven by catalogs and stored by internal identifiers. Getting a unique group of grades, cleaning up obvious matches (X52 vs. X-52), and matching against the list provided in CD_GRADE and

CD_MATERIAL will ensure that grade ids and material ids populated in post-migration will be matched up properly with EDM equivalent.

Critical DIMS Field Name	Database Table Name	Database Column Name
BHA Component Grade	BHACOMP	GRADE
BHA Component Material	BHACOMP	MATERIAL

A data analyzer query, *DistinctBHACompGrade.daq* and *DistinctMaterialCompGrade.daq* have been provided to aid in this step of the pre-preparation transfer of DIMS data. The queries can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Post-Migration Check

Running the SQL Statement below will display any rows which have been migrated that could not be matched up with a valid grade_id and thus the grade will not display in the Component Spreadsheet. This may happen as a result of the grade not existing or the grade not being valid for the section type to which it is associated.

- select well_id, wellbore_id, assembly_id, assembly_comp_id, sect_type_code, grade, grade_id from cd_assembly_comp where not exists (select 1 from cd_grade_sect_type where sect_type_code = cd_assembly_comp.sect_type_code and grade_id = cd_assembly_comp.grade_id) and grade is not null;

Critical DIMS Field Name	Database Table Name	Database Column Name
Grade	BHACOMP	GRADE
Grade	WELLCOMP	GRADE
Grade	EQPCOMP	GRADE

5. Identify Any Bits Not Associated with a BHA

In the DIMS database, a Bit and a BHA were on the same level of the data model. In the EDM database, a Bit is one component of the Drillstring. Steps must be taken in pre-migration to ensure that bit records are not lost; those bits not associated with a BHA will become a single element Drillstring containing only the Bit.

The following query will identify bits which have not been associated with a BHA in DIMS. If a BHA does exist, it is recommended that the bit be properly associated with that BHA. It is also important to verify that the bit does exist in the list of components for that BHA.

- SELECT i_key, e_key, bit_no, bit_key FROM BITS WHERE NOT EXISTS (SELECT 1 FROM BHAGEN WHERE i_key = BITS.i_key and e_key = BITS.e_key AND bit_key = BITS.bit_key);

Critical DIMS Field Name	Database Table Name	Database Column Name
Bit No - Run No	BHAGEN	BIT_NO

6. Group Like Mud Products Together

In the EDM database, the mud inventory is broken into two tables; one for unique products and another for their transactions. For a given Event, each product and its attributes will be listed only once with daily transaction being tied to the Daily Operations Report. The products are grouped together by product, unit, price and wt_perunit within each Event. Manually changing. fields within the same Event will aid in the data migration process.

The Data Analyzer™ query, *DistinctMudProducts.daq*, has been provided to display clients' grouped data. The query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Product	MUDINV	PRODUCT
Cost/Unit	MUDINV	PRICE
Units	MUDINV	UNIT
Size	MUDINV	WT_PERUNIT

7. Group Like Bulk Products Together

In the EDM database, bulk materials are broken into two tables, one for unique products and another for their transactions. For any given Event each product and its attributes will be listed only once, and each daily transaction will be tied to the daily report. The products are grouped

together by item and units within each Event. Manually changing inconsistent fields within the same Event will aid in the data migration process.

The Data Analyzer query, *DistinctBulkProducts.daq*, has been provided to display clients' grouped data. The query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Item	CONSUMP	ITEM
Units	CONSUMP	UNIT

8. Create Policies and Projects

Group Operators to Create Policies, Group Operator + Field to Create Projects

In the EDM database, each unique operator will become a Company (policy) that will be displayed in the Well Explorer. All wells belonging to an operator which a client wishes to have grouped into a Company should have the same operator value.

In the EDM database, within each operator, each unique field will become a Project by default. All wells belonging to a common operator which a client wishes to have grouped into a Project should have the same field value.

The Data Analyzer queries, *DistinctOperator.daq* and *DistinctOperatorandField.daq*, have been provided to display a unique list of operators and operators + field_names. The queries can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Note

If a client has only one operator in their database and they wish to not use the policy node for Company, but rather for individual business units, then the pre-migration query #37 should be modified to group by a different field and the grouping of data should be viewed in that context.

Critical DIMS Field Name	Database Table Name	Database Column Name
Operator	WELLIST	OPERATOR
Field	WELLIST	FIELD_NAME

9. Ensure Offshore Wells are Marked with the Offshore Flag

If offshore wells are not marked with an offshore flag, the migration of data from the DIMS database to the EDM database may be incorrect. Verify that the water depth field for each of the offshore wells is properly populated. Verify that the ground level elevation field for onshore wells is properly populated. Offshore wells should not have ground level elevation populated, and onshore wells should not have water depth populated.

Data Analyzer queries, *OffshoreOnshoreElevations.daq* and *DistinctPlatformandBlock.daq*, have been provided to assist with analyzing this data. The queries can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Offshore (checkbox)	WELLIST	OFFSHORE
Waterdepth	WELLIST	WATERDEPTH
Ground Level	WELLIST	GL

10. Ensure all Wells belonging to the Same Platform or Pad can be Grouped Together

In the EDM database, a Site is a location with common geographical attributes where one or more wells can be grouped together. Examples of this are offshore platforms and onshore pads. Ensuring that all wells that can be grouped together have the same value in platform, and either have the same value in block or have block null will assure they are grouped together properly in migration. The wells do not have to be

marked as offshore; only the platform field and block fields will be interrogated for this purpose.

Critical DIMS Field Name	Database Table Name	Database Column Name
Platform	WELLIST	PLATFORM
Block	WELLIST	OFF_SH_BLK

11. Ensure that All Wells were Entered with the Same Reporting Standard and Using the Same Reporting Time

In the EDM database for the Daily Time Breakdown, instead of having a 'from' and 'to' time with only one date, each line now has a date/time 'from' and a date/time 'to' field. To populate these fields properly, the pre-migration script takes into account the reporting standard defined in the DIMS system Report Period (SYSINFO setting value = x/1-4) and assumes the standard reporting times are used consistently. If the client is using reporting standard 3 or 4 and is using a time other than 06:00, Query #48 in the pre-migration script (open up scripts EDT_5000.1\EDM\Data Migration\Scripts\Dims\pre-migration.ora in Notepad or Word Pad should be read and adjustments to the time field made. If a user has data with inconsistent reporting standards or inconsistent report times, it is recommended that it be migrated in batches so that all data with the same standard is moved together against the same set of rules.

12. Ensure Perforated Assembly Name Has a Value that Matches one of the Assemblies in the Well if possible

Ensure that the perforated assembly name has a value that matches one of the assemblies in that well, and that the date of the perforation report is on or after the date of the Casing/Wellbore equipment assembly report date if the assembly is available in the DIMS database.

In the EDM database, the perforated assembly is stored via its assembly_id. The field for assembly_name did remain in the CD_PERFORATE table, because it would be critical to know the name of the perforated assembly, and if the program cannot find it by name and date in the list of assemblies, it was deemed too critical to leave it completely blank. Therefore the DIMS GEN_PERF.assembly_name data will migrate even if no match can be found for the assembly_id. However it is best to compare Perforation and Casing/Wellbore

Equipment records to ensure that these names match. The result will be the migration of *both* assembly.name and assembly.id.

Critical DIMS Field Name	Database Table Name	Database Column Name
Perforated Assembly	GEN_PERF	ASS_NAME

13. Convert Daily Holesize Records to use the Hole Section Table if necessary

Convert Daily Holesize records to use the Hole Section table if it has not already been done. The majority of clients using DIMS software already use the Hole Section table.

In past releases of DIMS software there was a utility provided called HoleSize Conversion which took the values in Daily.holesize and created records in HOLESECT. SYSINFO parameter (HOLE SIZE TABLE), and provided clients with the choice to either enter the hole size on a daily basis as DIMS software had done in the past, or to enter hole sections. In the EDM software, the Hole Section model is used, and there is nothing analogous to the Daily Holesize entered manually. For that reason, all clients need to have the DIMS HOLESECT table populated in order for the migration to work. If a company is not using the Hole Sections correctly (i.e., HoleSizeTable = No in SYSINFO), they should run the Hole Section Conversion Utility against their DIMS data prior to conversion. If this table was blank before, the utility will create the records in HOLESECT and leave the values on DAILY.holesize intact. The Hole Section Conversion Utility (hlszcv32.exe) is available in the DIMS installation folder once the DIMS 1998.7 Database Update has been run.

Critical DIMS Field Name	Database Table Name	Database Column Name
Section Base	HOLESECT	BOTTOM_MD
Section Top	HOLESECT	TOP_MD
Is Pilot Hole?	HOLESECT	PILOT_HOLE
Start Date	HOLESECT	DATE_START
End Date	HOLESECT	DATE_END
Hole Size (OD)	HOLESECT	HOLE_SIZE

14. Ensure Pool Names and Formation Names are Consistent.

In the EDM database, the Formation Tops for a given Project are generated out of the Formation names from each of the Wells/

Wellbores. If a formation name is spelled differently within different wells, it will become two “strat unit” records instead of just one record. These strat units become the list of formations for a given Project that an OpenWells user can choose from for formations. These formations for the well/wellbore are then used for choosing formations in objects such as Perforations and Formation picks (samples and logs). Similarly, the Pools/Reservoirs in a given Project are generated out of the Pool/Reservoir names from the Wells/Wellbores. These pool names should be consistent. For instance, 1ST HOLEMAN and 1st. HOLEMAN will be generated as two separate records, when it is evident by looking at it that they should be the same value.

Two Data Analyzer queries, *DistinctPool.daq* and *DistinctFormationNames.daq*, have been provided to assist in getting a unique list of values for these objects. The queries can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Formation Name	FORMTOP	FORMATION
Pool Name	SUMPOOL	POOL_NAME
Pool Name	SUMINTVL	POOL_NAME
Formation Name	PERF_INT	FORMATION
Pool Name	DAY_POOL	POOL_NAME

15. Ensure Support Craft Items are Consistent (Within a Given Well)

In the EDM database, support craft have been split out into objects and transactions (similar to mud). A vessel will be listed only once for the well and each time it enters the location, a daily transaction record will be recorded. For migration, the rows are grouped together by type of vessel within a given well.

A Data Analyzer query, *DistinctSupportCraft.daq*, has been provided to assist in seeing this grouped data. The query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Type	SUPPORT	TYPE

16. Ensure the Personnel Records are Consistent (Within a Given Well and Event)

In the EDM database, Personnel has been split out into objects (people/company) and transactions (people on location). A company or person will be listed only once per Event, and each time they are on location, a daily transaction record will be recorded. For migration, the rows are grouped together by company, department, duties, name, employee number, job title, social security number. The model fits companies that only track a company, such as XYZ Drilling or a client who tracks each individual, or a combination. Rows will be created for each unique combination of these fields. If a company was listed as Halliburton, then later in the event listed as Halliburton, that would cause two personnel records to be created.

A Data Analyzer query, *DistinctPersonnel.daq*, has been provided to assist in seeing this grouped data. The query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Company	PERSONNE	COMPANY
Department	PERSONNE	DEPARTMENT
Duties	PERSONNE	DUTIES
Employee No	PERSONNE	EMPLOYEENO
Employee Name	PERSONNE	FULL_NAME
Social Security No	PERSONNE	SSN
Job Title	PERSONNE	JOB_TITLE

17. Ensure Kick-Off Dates for Sidetracks are Complete and Correct; Ensure Start Dates and End Dates for Events are Complete and Correct

These dates will be used to associate Events with Wellbores, and within OpenWells itself for determining when to display data associated with these objects. One of the pre-migration queries will set the Wellbore ko_date = spud date when it is blank and the record is sidetrack ‘OH’. This will clean up the original hole records.

The Data Analyzer queries, *SidetrackswithnoParents.daq* and *DistinctEventStartEndDates.daq*, has been provided to compare Event end/start dates with the least and greatest Daily dates within that Event

and to view blank kick off dates. The queries can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Kick Off Date	SIDETRCK	KO_DATE
Event Start Date	EVENT	START_DATE
Event End Date	EVENT	END_DATE

18. Ensure that the Last Casing/Next Casing Size Records are Valid and Consistent from Day-to-Day within an Event

In the EDM database, the last/casing next/casing records in the Daily Operations Report are not recorded daily. They are part of the hole section definition that should be entered only when a casing string is run or a hole size changes. The migration looks for unique last casing and next casing combinations and merges this information with the appropriate hole section record. Data where the last casing size does not change when casing is run, or that is not consistent from day to day for that Hole Section record will cause problems. Also, last casing sizes that are less than or equal to the next casing sizes (such as expandable tubulars, monobore wells, bi-centre) needs to be checked.

The Data Analyzer queries, *LastNextCasingCompare.daq* and *DistinctCasingInfo.daq*, and *LeakOffTestData.daq* have been provided to assist in identifying problem data for last casing and next casing size records. The queries can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Similarly, Leak Off Test information is migrated only once per test in the EDM software, rather than Daily. As a result, each time the test type and date changes, a new Leak Off Test record will be created. Consistent and complete Leak Off Test Types and Dates are important for correct migration of data from the DIMS database to the EDM database.

Critical DIMS Field Name	Database Table Name	Database Column Name
OD	DAILY	LSTCSSZ
ID	DAILY	LSTCSGID
Set TMD	DAILY	LSTCSGTOP
Grade	DAILY	LSTCSGDE

Critical DIMS Field Name	Database Table Name	Database Column Name
Next Casing Size	DAILY	NEXTCSGSZ
LOT/FIT	DAILY	TESTTYPE
Test Date	DAILY	TESTDATE
TVD	DAILY	PIT_TVD

Only one LOT/FIT Test per Hole Section is supported in the EDM database. To that end, work is done in both pre- and post-migration to enforce this rule during migration.

19. Ensure Consistent Measurement Points in Datums and Correct Reference Depth Elevations

EDM Data Services software retrieves RDL tagged depths back to the current depth reference datum elevation. During the migration, depth fields in the DIMS database are depth shifted by the permanent depth reference elevation from the DIMS database to store them in the EDM database relative to the system datum (e.g. Mean Sea Level). Within EDM, all depth fields are stored physically within the database relative to system datum for each Project. For instance, if the permanent reference of a given well is 200’ KB above MSL, all depth related fields are adjusted by that amount as the EDM database will add the Datum Elevation to all RDL tagged depths before returning the value to the calling application.

For users already using the RDL feature in the 2003.0.1 DIMS release, the FDD_DICT table will already include the new RDL flags. For those not using DIMS RDL, the first pre-migration script will apply the Landmark standard RDL flags. The data migration will handle both types of DIMS RDL configurations. Each well in the database should have depths entered with reference to the same permanent reference elevation. For example, if a well is an onshore well and the permanent reference is KB, and that measurement is above MSL (ground level elevation + KB distance), all depths for that Well in the database should be measured from that same reference elevation. That does not mean that each well can’t have its own permanent reference, just that all depths are consistent, so there is not a well where ground level = 0 where the well is actually 3000’ above MSL. The value in this permanent reference elevation field is critical when depth shifting

occurs and great care should be taken to make sure it is correct for each well.

Critical DIMS Field Name	Database Table Name	Database Column Name
Current Well RDL	WELLIST	PERM_DATUM
Datum	RDL	RDL_NAME
Elevation	WELLIST	DATUM_ELEV
Elevation	RDL	RDL_ELEV
Rig Name/Work Unit	RDL	RDL_RIG

The following table shows which fields are the default RDL fields in the DIMS database. If a customer already has RDL set up in the DIMS database and has any rows marked with the "R" flag in FDD_DICT, then the scripts to update DIMS fields to be flagged as RDL will not be applied. However, if the customer did not have any R flags in their database, then these fields listed below will get set to be treated as RDL fields. It is recommended that a customer run the scripts from the DIMS software to update FDD_DICT with the default RDL fields if they have not already done so, and then modify these default fields where necessary (for example, if they were using a field in the DIMS software that is considered RDL for an alternate purpose and have changed the unit).

Table Name	Field Name	Field Description	Unit
BHAGEN	DEPTH_IN	Depth BHA entered hole.	13
BHAGEN	DEPTH_OUT	Depth BHA pulled out of hole.	13
BHAOPS	CHECKDEPTH	Depth at time of BHA check.	13
BITOPS	DAYDEPTH	Depth at time of bit check	13
BITS	DEPTHIN	Depth Bit was Put Into Hole	13
BITS	DEPTHOUT	Depth Bit Was Pulled Out of hole	13
CENT_OPS	RECD_DEPTH	Depth at which this record was entered for.	13
CLONE_OP	RECD_DEPTH	Depth at which this record was entered for.	13
CMTSLUR	SL_FROM	Slurry Interval From Depth	14
CMTSLUR	SL_TO	Slurry Interval To Depth	14
CMTSTAGE	CTU_DEPTH	Coil Tubing Unit Depth	99
CMTSTAGE	DEPTH_CIRC	Circulating out Depth	13
CMTSTAGE	INT_BASE	Bottom of Stage Interval	14

Table Name	Field Name	Field Description	Unit
CMTSTAGE	INT_TOP	Interval Top Depth	13
CMTSTAGE	SQ_BOT	Depth of Bottom of Interval Squeezed	14
CMTSTAGE	SQ_TOP	Depth of Top of Interval Squeezed	99
CMTSTAGE	STR_DEPTH	Total Depth of Work String for Squeeze Job	99
CMTSTAGE	TOOLDEPTH	Tool Depth	99
COMPACCS	INTFROM	Interval Depth From	13
COMPACCS	INTTO	Interval Depth To	13
CORES	INT_FROM	Interval Depth From	14
CORES	INT_TO	Interval Depth To	14
CORETIME	END_DEPTH	End Depth	13
DAILY	DEPTH	Depth of well at report time (TMD).	13
DAILY	FORMTOP	KB depth for the current formation top.	13
DAILY	LINER_TOP	Depth of Top of Liner	13
DAILY	LSTCSGDE	Landed Depth of last Casing / Liner run.	13
DAILY	LSTCSGTOP	Last Casing / Liner Top Set	13
DAILY	LSTCSGTVD	True Vertical Depth of last Casing / Liner run.	13
DAILY	NEXTCSGDE	Next casing depth.	13
DAILY	NEXTCSGTVD	Next Casing True Vertical Depth	13
DAILY	PBTMD	Plugged back measured depth.	13
DAILY	PBTVD	Plugged back true vertical depth.	13
DAILY	PCKR_DEPTH	Packer Depth	13
DAILY	PIT_DEPTH	Leakoff test depth.	13
DAILY	PIT_TVD	Leakoff test true vertical depth.	13
DAILY	TBG_DEPTH	Tubing Set Depth	13
DAILY	TVD	True vertical depth.	13
DAY_POOL	INT_FROM	Interval Depth From	13
DAY_POOL	INT_TO	Interval Depth To	13
DSTBOMB	BOMBDEPTH	Depth of Bomb	13
EQP_STAT	INT_FROM	Top Interval	13
EQP_STAT	INT_TO	Base Interval	13
EQPCOMP	TOP_SET	Setting Depth of the Top of the Component	14
EVENT	PBTMD	Plug Back Measured Depth	14
EVENT	PBTVD	Plug Back True Vertical Depth	14

Table Name	Field Name	Field Description	Unit
EVENT	TMD	True Measured Depth	14
EVENT	TVD	True Vertical Depth	14
FORMTEST	TMD	True Measured Depth	14
FORMTEST	TVD	True Vertical Depth	14
FORMTOP	LOGMD	Logged Measured Depth	14
FORMTOP	LOGTMDBASE	Logged TMD, Base	13
FORMTOP	LOGTVD	Logged True Vertical Depth	14
FORMTOP	PRGTMDBASE	Prognosed TMD, Base	13
FORMTOP	PROG_TMD	Formation Top Prognosed Measured Depth.	14
FORMTOP	PROG_TVD	Prognosed True Vertical Depth	14
FORMTOP	SAMPMD	Samples Measured Depth	14
FORMTOP	SAMPTVD	Samples True Vertical Depth	14
FORMTOP	SMPTMDBASE	Sampled TMD, Base	13
GASMAN	MAN_MEASKB	Depth Reference Point to Mandrel	13
GASVLV	VLV_MEASKB	Depth Reference Point to Valve Depth	13
GEN_CMT	CMT_BASE	Base of Cement	14
GEN_CMT	CMT_TOP	Top of Cement	99
GEN_CMT	CSQ_DEPTH	Casing/Tubing Squeeze Depth	13
GEN_CMT	DEPTHSET	Casing/Tubing Set Depth	13
GEN_CMT	HOLE_DEPTH	Open Hole at Time of Shoe Test	99
GEN_CMT	PLUG_BOT	Bottom Plug Depth	13
GEN_CMT	PLUG_TOP	Top Plug Depth	13
GEN_CMT	SQCSGDEPTH	Setting Depth of Casing Being Squeezed	13
GEN_CMT	SQDEPTH	Depth of Squeeze	13
GEN_CORE	INT_FROM	Interval Depth From	13
GEN_CORE	INT_TO	Interval Depth To	13
GEN_CPMP	SET_DEPTH	Set Depth	13
GEN_CPMP	SET_DEPTH2	Set Depth	13
GEN_DST	DEPTH	Depth	14
GEN_DST	INT_BOTTOM	Interval Depth Bottom	13
GEN_DST	INT_TOP	Interval Top Depth	13
GEN_EQPP	ANCH_CAT	Anchor Catcher Depth	13

Table Name	Field Name	Field Description	Unit
GEN_EQPP	FAIL_DEPTH	Depth of Equipment Failure	99
GEN_EQPP	MUD_ANCHOR	Mud Anchor	13
GEN_EQPP	PACKER	Packer Type	13
GEN_EQPP	SEAT_NIPPL	Depth of Seat Nipple	13
GEN_ESP	TOT_SET	Total Set Depth	13
GEN_GEO	CAR_DE	Carbide Depth	13
GEN_GEO	CONNGASDE	Depth at Which Connection Gas is From	13
GEN_GEO	DEPTH	Depth	13
GEN_GEO	LASTCSGDE	Last Casing Set Depth	13
GEN_GEO	LASTCSGTVD	Last Casing True Vertical Depth	13
GEN_GEO	LASTSURDEP	Last Survey Depth	13
GEN_GEO	LASTSURTVD	Last Survey True Vertical Depth	13
GEN_GEO	TRIPGASDE	Trip Gas Depth	13
GEN_GEO	TVD	True Vertical Depth	13
GEN_GVPK	INT_FROM	Interval Depth From	13
GEN_GVPK	INT_TO	Interval Depth To	13
GEN_GVPK	PRESS_TVD	Formation Pressure TVD	13
GEN_GVPK	S_TOP	Top of Sand	14
GEN_LOG	CURLG_LINR	Current Log Liner Top	13
GEN_LOG	CURLOG_FIL	Current Log Fill Depth	13
GEN_LOG	CURLOG_PBD	Current Log Plug Back Depth	13
GEN_LOG	CURLOG_TBG	Current LogBottom Tubing	13
GEN_LOG	CURLOG_TD	Current Log Total Depth	13
GEN_PERF	BASE_INT	Interval Base	13
GEN_PERF	FLUID_HEAD	Initial Fluid Head	13
GEN_PERF	FLUID_LEVL	Fluid Level	13
GEN_PERF	RES_DEPTH	Reservoir Depth	13
GEN_PERF	TOP_INT	Interval Top	13
GEN_PIPE	EST_SETLEN	Estimated Set/Run Length	13
GEN_PRES	ED_FLD_LVL	Ending Fluid Level	14
GEN_PRES	GAUGE_BTM	Depth of Bottom Gauge	14
GEN_PRES	GAUGE_TOP	Depth of Top Gauge	13

Table Name	Field Name	Field Description	Unit
GEN_PRES	INT_BASE	Bottom Depth of Interval	13
GEN_PRES	INT_TOP	Top Depth of Interval	13
GEN_PRES	MID_DEPTH	Mid Depth of Interval	13
GEN_PRES	ST_FLD_LVL	Starting Fluid Level	14
GEN_STIM	BASE_INT	Interval Base	13
GEN_STIM	BPLUG_DPTH	Bridge Plug Depth	13
GEN_STIM	PACK_DEPTH	Packer Set Depth	13
GEN_STIM	TBG_DEPTH	Tubing Set Depth	13
GEN_STIM	TOP_INT	Interval Top	13
GEN_TEST	FN_FLD_LVL	Final Fluid Level	13
GEN_TEST	IN_FLD_LVL	Initial Fluid Level	13
GEN_TEST	INT_BASE	Interval Base	13
GEN_TEST	INT_TOP	Interval Top Depth	13
GEN_TEST	MAX_FL_LVL	Maximum Fluid Level	13
GEN_TEST	MIN_FL_LVL	Minimum Fluid Level	13
GEN_TEST	PUMP_DEPTH	Pump Depth	13
GEN_WEQP	TOTALDEPTH	Total Measured Depth	13
GEN_WEQP	SUSP_DEPTH	Casing Top Depth	43
GEN_WEQP	LAND_DEPTH	Casing Setting Point Depth	45
GEN_WEQP	TOTALTVD	Total True Vertical Depth	13
GENWORKA	INTRVL_BAS	Interval Depth Base	13
GENWORKA	INTRVL_TOP	Interval Top Depth	13
GVPKSCRN	DEPTH	Depth	14
HOLESECT	BOTTOM_MD	MD at Bottom of Hole Section	13
HOLESECT	BOTTOM_TVD	TVD at Bottom of Hole Section	13
HOLESECT	PLAN_MD	Planned MD	13
HOLESECT	PLAN_TVD	Planned TVD	13
HOLESECT	TOP_MD	MD at Top of Hole Section	13
HOLESECT	TOP_TVD	TVD at Top of Hole Section	13
INTANG	INT_FROM	Interval Depth From	13
INTANG	INT_TO	Interval Depth To	13
KICK_OP	TMD	Total Measured Depth	14
KICK_OP	BIT_DEPTH	Bit Depth	0

Table Name	Field Name	Field Description	Unit
KICK_OP	TVD	True Vertical Depth	14
LITHINT	INT_FROM	Interval Top Depth	13
LITHINT	INT_TO	Interval Bottom Depth	13
LITHINT	TVD	True Vertical Depth from Reference	13
LOG_CC	LOG_CC	Log Casing Collar Depth	13
LOG_DESC	INTRVL_BAS	Interval Depth Base	13
LOG_DESC	INTRVL_TOP	Interval Top Depth	13
LOG_INT	INT_FROM	Interval Depth From	13
LOG_INT	INT_TO	Interval Depth To	13
MUDCHECK	DEPTH	Depth of Well at Time of Mudcheck	14
MUDCHECK	OIC_DEPTH	Oil in Cuttings Measurement Depth	13
MUDCHECK	SAMPLE_PT	Depth at which Sample was Taken	14
MUDCHECK	TVD	True Vertical Depth	14
MUDGAS	INT_FROM	Interval Depth From	13
MUDGAS	INT_TO	Interval Depth To	13
MUDGAS	TVD_FROM	True Vertical Depth, Top	13
MUDGAS	TVD_TO	True Vertical Depth, Base	13
MUDOIL	INT_FROM	Interval Depth From	13
MUDOIL	INT_TO	Interval Depth To	13
OPSUM	ZDEPTH	Depth for Operation Code	14
OPSUM	ZDEPTH_TO	Depth To	14
PERF_INT	BASE_INT	Interval Base	14
PERF_INT	CC	Casing Collar Reference Depth	14
PERF_INT	CC_TSHOT	Casing Collar Locator Top Shot	14
PERF_INT	TOP_INT	Interval Top	14
PLANCSG	INTFROM	Interval Depth From	13
PLANCSG	INTTO	Interval Depth To	13
PLANCSG	SET_TVD	TVD of Casing Interval	13
PLANHOLE	INTFROM	Interval Depth From	13
PLANHOLE	INTTO	Interval Depth To	13
PLANHOLE	TVDFROM	Interval True Vertical Depth From	13
PLANHOLE	TVDTO	Interval True Vertical Depth To	13
PLANINC	INTFROM	Interval Depth From	13

Table Name	Field Name	Field Description	Unit
PLANINC	INTTO	Interval Depth To	13
PLANMUD	INTFROM	Interval Depth From	13
PLANMUD	INTTO	Interval Depth To	13
PLANMUD	MD_GRAD	Measured Depth of Gradient	13
PLANMUD	TVD_GRAD	True Vertical Depth of Gradient	13
PLANMUD	TVDFROM	Interval True Vertical Depth From	13
PLANMUD	TVDTO	Interval True Vertical Depth To	13
PLANST	BOK_TMD	Bottom of Sidetrack Section Measured Depth	13
PLANST	BOK_TVD	Bottom of Sidetrack Section True Vertical Depth	13
PLANST	TARG_TVD	Target True Vertical Depth	13
PLANST	TOK_TMD	Kick Off Measured Depth	13
PLANST	TOK_TVD	Kick Off True Vertical Depth	13
PLANSURV	DEPTH	Depth of Survey	13
PLANSURV	TVD	True Vertical Depth	13
PUMPOPS	RECD_DEPTH	Depth at which this record was entered for.	13
SHAKEROP	RECD_DEPTH	Depth at which this record was entered for.	13
SIDETRCK	BOK_TMD	Measured Depth of Bottom Current Hole Section	14
SIDETRCK	BOK_TVD	True Vertical Depth of Bottom of Current Hole Section	14
SIDETRCK	PBTMD	Plugged Back Measured Depth	14
SIDETRCK	PBTVD	Plugged Back True Vertical Depth	14
SIDETRCK	TARG_TVD	Target True Vertical Depth	14
SIDETRCK	TOK_TMD	Kick Off Measured Depth	14
SIDETRCK	TOK_TVD	Kick Off True Vertical Depth	14
STIMSTG	CTU_DEPTH	Coil Tubing Unit Depth	13
STIMSTG	INT_BASE	Interval Base Depth	13
STIMSTG	INT_TOP	Interval Top Depth	13
STIMSTG	PACK_DEPTH	Packer Set Depth	13
STIMSTG	TBG_DEPTH	Tubing Set Depth	13
SUMINTVL	INT_BASE	Perforated Interval Bottom Depth	14
SUMINTVL	INT_TOP	Perforated Interval Top Depth	14
SUMPOOL	BOT_PAY	Bottom on pay zone	13

Table Name	Field Name	Field Description	Unit
SUMPOOL	TOP_PAY	Top of pay zone	13
SURVEYS	DEPTH	Depth of Survey	14
SURVEYS	TVD	True Vertical Depth	14
TESTCAV	INT_BASE	Base of Interval	14
TESTCAV	INT_TOP	Top of Interval	14
TESTPUMP	FLUID_LEVL	Fluid Level	14
TESTSWAB	FLUID_LVL	Fluid Level	13
TESTSWAB	SWAB_DEPTH	Depth of Individual Swab	13
WELLIST	AUTH_TMD	Authorized TMD	13
WELLIST	AUTH_TVD	Authorized True Vertical Depth	13
WELLIST	BUDGET_TMD	Budget TMD	13
WELLIST	BUDGET_TVD	Budget TVD	13
WELLIST	DD	True Measured Depth	14
WELLIST	FILL	Current Fill Depth	14
WELLIST	PBD	Plug Back Depth	14
WELLIST	TVD	True Vertical Depth	14

20. Ensure Data Migration: Ensure RDL Flags are Removed for the RDL values DAILY.pitdepth and DAILY.pit_tvd

During the migration of data, EDM equivalents of DAILY.pitdepth and DAILY.pit_tvd are set as non-RDL values. If DIMS used RDL, then the R flag should be removed from the a7_sys.mbd.fdd_dict prior to running the data migration.

21. Ensure that the new DIMS SYSINFO Parameters Being Used by the Migration Toolkit are Present

ReportPeriodTime—this will be your company's normal reporting time, so 00:00, 05:00, 06:00, or 24-hr time format. This will go into CD_POLICY and be used for reporting standard related data-comparisons.

BHAComp_SortOrder—ASC/DESC (ASC for top-down entry, DESC for bottom-up entry)

RDLSystemDatum—This will be the default system datum description for all policies created from the DIMS database migration. Typical system datum names may be used (e.g., Mean Sea Level, Ground Level).

EnableRDL—Yes or No (if left out, the default is No). Dictates how the CD_DATUM records will be created, using the new RDL tables or generating multiple records from WELLIST for each “elevation”.

Storage_Unit_Set—API or SI. Define the Base Storage Unit set of the migrated DIMS data.

The DIMS data to EDM data default migration has been written to support both DIMS 2003.0 software (DB Version 5.0.0) and DIMS 2003.0.1 software (DB Version 6.0.0). In DB Version 6.0.0 there is one additional table (RDL) which is migrated if the RDL functionality is being used. If the DIMS legacy database being migrated is Version 5.0.0, the staging step of the migration will log an error alerting the user to the fact that the RDL table does not exist in the source database. This message is normal for the DB Version 5.0.0 and can be ignored.

Valid Values	Database Table Name	Key
DESC/ASC	SYSINFO	BHAComp.SortOrders
Mean Sea Level/Ground Level	SYSINFO	RDLSystemDatum
Yes/No	SYSINFO	EnableRDL
00:00/06:00/05:00, etc.	SYSINFO	ReportPeriodTime
API/SI	SYSINFO	Storage_Unit_Set

22. Look for Blank or Invalid Keys in DAYCOST

There is a Charge Key Mismatch report available in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials\mismatch.exe which will identify DIMS wells with this problem. This key is what is used to associate any cost item with an AFE.

Critical DIMS Field Name	Database Table Name	Database Column Name
AFE	DAYCOST	CHARGE_KEY

23. Ensure all Sidetrack Records are Numbered and Assigned a Parent Sidetrack

Ensure all sidetrack records which are not 'OH' (Original Hole) in the Sidetrack Number field have been assigned a parent sidetrack.

There is a Data Analyzer query, *SidetracksWithNoParent.daq*, to assist in identifying sidetracks, which have not been assigned a parent sidetrack. The query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

Critical DIMS Field Name	Database Table Name	Database Column Name
Kicked Off From	SIDETRCK	LINK_GEN
Sidetrack No	SIDETRCK	SIDETRCKNO

24. Change Zero values to NULL

Clients who wish to modify the 0 values in DIMS by changing them to NULL have the options of using a predefined script. This script will change 0 values to NULL for any table/field combination designated by the client. To do this, open the a7_sys.mdb.FDD_DICT database table and add an "*X*" into the flags column for any numeric fields that are to be migrated with a null instead of a 0. During pre-migration, fields containing an "*X*" in the flags column, will be updated from 0 to NULL. These fields will appear in EDM with a NULL value.

25. Check Lithology mappings and use of the PK_GROSLITH picklist

Lithology codes in the DIMS database must match items in PK_GROSLITH, which in turn must match items in CD_LITHOLOGY_CLASS. If the DIMS picklist table is not named PK_GROSLITH, either add it to the DIMS DSN_PICKLIST data source or modify query #66 to reference the name of the DIMS lithology picklist table actually used within the DIMS database.

26. Check Logging Intervals information/services format

Logged Interval information/services, in the DIMS Logging Report, were designed to use the Service picklist. This enabled services to be listed over an interval and codes concatenated. For example GNR-CBL-CAL-CCAL.

Clients who manually entered these services as codes and did not separate with a "-" will have errors during the migration. Client who manually entered the service name instead of the code will have errors during the migration. These fields must be changed to use the appropriate service codes from the DIMS picklist to prevent errors.

For Companies that have used only one service per line, using the codes will not have errors during the migration. Multiple codes per line that are not separated by the "-" character will not be parsed correctly. If the service was manually entered using the service name instead of the code (e.g., GAMMA RAY NEUTRON), the string may be too long for the target in EDM and the insert will fail.

For a successful migration to occur, the appropriate code must be selected from the service picklist.

27. Ensure Casing and Wellbore Equipment components picklist in EDM match the DIMS Component Group Name

Prior to migrating data, it is important to add rows to the EDM picklist MD_PK_COMP_TYPE in the area of casing and wellbore equipment components. This is to ensure the DIMS Component Group Names match the EDM picklist, and that they are placed in the appropriate section type.

For example, if you had a component in DIMS called *Perforated Tubing Gun* that was used within the Wellbore Equipment reports, you would add a line to MD_PK_COMP_TYPE with a sect_type_code of '*WBEQP*' and a comp_type_code. The comp_type_code can be defined by the user; it must be unique, less than 6 characters, and in all CAPS. (e.g., *PRFTG* would be a valid entry). The description would be "*Perforated Tubing Gun*" and the is_user_defined flag could be set to '*Y*'. The sect_type_code MUST be one that is defined within MD_SECT_TYPE (which should not be added to by the client). And, reviewing MD_STRING_SECT_MAP and MD_STRING_TYPE will display the equipment component section types that are available for the different string types. This will allow the user to ensure that the new component shows up in the report as desired. The reason for these additions is so the update statements performed in post migration to populate the comp_type_code field in CD_ASSEMBLY_COMP can be completed as correctly as possible.

Within pre-migration, a sect_type_code field in EQPCOMP is created This field is then set to either CAS or WBEQP, based on whether the report is a Wellbore Equipment Report (is_casing = 'N') or a Casing

Report. It is possible for the client to manually change the sect_type_codes to match the MD_PK_COMP_TYPE (e.g., packers and rods which have their own sect_type_codes rather than being '*WBEQP*'). This can ONLY be done after the Pre-Migration step and before the Transfer step. Once the migration has completed it would be possible to update the comp_type_codes with appropriate ones from the picklist, rather than having no matches because Dual Packer exists within the sect_type_code of PKR instead of the sect_type_code of *WBEQP*.

28. Check DST Flow Rates and Flow Period Redesign

In the DIMS Drill Stem Test report there was no link between the General Flow Data spreadsheet and the detailed Flow Rate data. During the conversion, there is a line inserted in DSTFLOW as a parent for each unique flow period in DSTRATE. The client should check the data in DSTRATE.flowperiod and ensure that all recordings that were taken during the same "flow" have the same value in this field. If there is only one unique value and there is only one row in DSTFLOW, all rows are associated with that one DSTFLOW record. If not, records will be created to satisfy the requirement of having a "parent" DSTFLOW record.

29. Ensure CD_SURVEY_TOOL table exists

An update performed in post migration is applied to CD_SURVEY_TOOL.description based on PK_SURVTYPE. Users must ensure that this table does in fact exist, and that their tools in the picklist match the tools used in their DIMS data (e.g., MMS, INC).

30. Ensure there are no blank Report dates in Daily Reports

Ensure there are no blank Report dates (DAILY.ddate) in Daily Reports. When associating survey stations with survey headers, blank dates make it impossible to properly sort and associate the surveys.

31. Ensure each Survey has a Tie-in Point and that it is at the minimum Depth for that Survey run.

Ensure that each survey has a tie-in point, and that it is at the minimum depth for that survey run. If tie-in points do not exist in the DIMS database or if a Sidetrack changes and the tie-in point does not exist, the pre-migration queries will create tie-in points to meet EDM survey requirements.

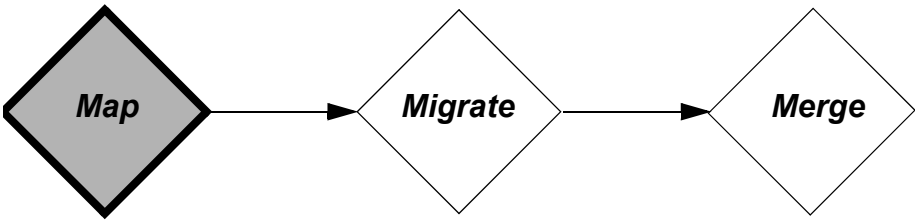
The Data Analyzer query *SurveyTypesandTieInPoints.daq* identifies surveys that do not meet this requirement. This query can be found in the EDM Engineering 5000.1 download in \Products\DIMS-DB-Upgrades\Data Quality Checking Materials, in the EDMDAQueries.zip file.

32. Ensure the "R" flag is removed from the FDD_DICT if RDL was used in the DIMS database

If RDL was used in the DIMS database it is important to remove the "R" flag from teh PERF_INT.cc_tshot row of the FDD_DICT table. This flag will cause an adjustment in the depth during the migration. The FDD_DICT table is located in the a7_sys.mdb (or equivalent) DIMS database file.

Drilling Field Mapping

Overview



The Drilling Field Mapping tool allows the client implementation team to map equivalent fields from legacy databases to the EDM™ database. This enables the client to customize, when necessary, how data is migrated from legacy databases to the EDM database.

The mapping sets shipped with the Engineer's Desktop™ 5000.1 software are complete for the COMPASS™ and WELLPLAN™ applications. (Mapping sets for CasingSeat™ and StressCheck™ applications are not necessary, as legacy data for these applications is not stored in a database.) The DIMS™ data mapping set is complete for all reports supported in the OpenWells® 5000.1 software release.

Important!

There should be no reason for clients to modify the mapping sets shipped for the COMPASS and WELLPLAN applications. Mappings for these applications are provided for client reference.

The DIMS application allowed clients to customize data fields for purposes other than that provided by the default configuration. As a result, the DIMS mapping sets may require customization based on client choices as they used and modified DIMS software to meet their needs.

If after reviewing the mapping set it is necessary to make some changes, the sets shipped with this version can be copied and modified.

For detailed information regarding the mapping sets that are shipped with this release, see "Appendix B: Mapping Sets" on page 159.

This section provides a detailed description of the purpose of the Drilling Field Mapping tool, as well as the process for using the tool.

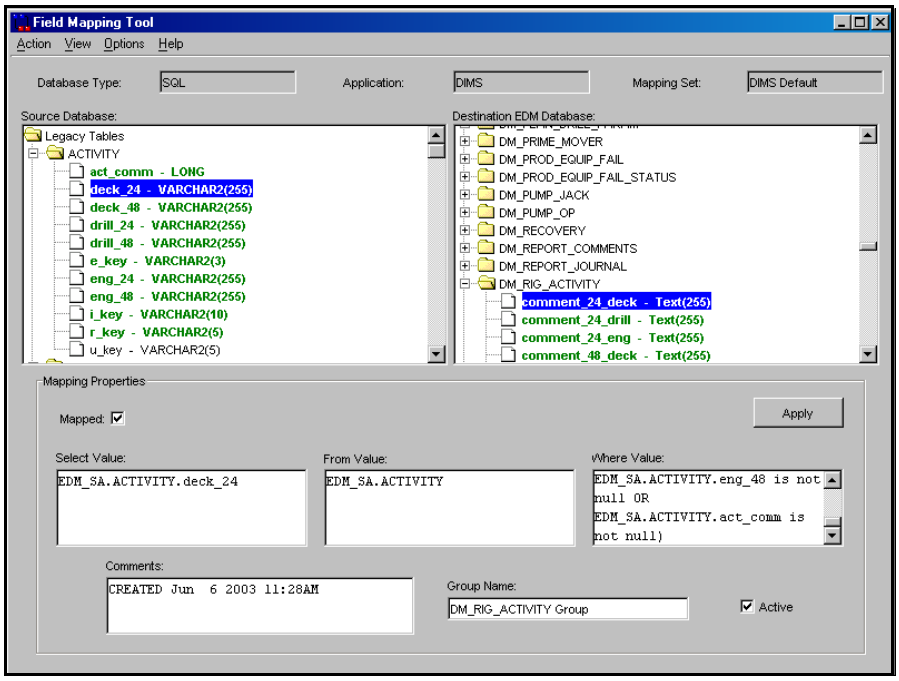
Purpose

The Field Mapping Tool allows the client implementation team to modify where data will be migrated in the EDM database during the data migration. Within the Field Mapping Tool, the database table and field name (column) mappings are displayed for the legacy database and the EDM database. The Data Migration tool then takes the data from the location specified in the legacy database and transfers the data into the location specified in the EDM database, using the mapping set (see “Drilling Data Migration” on page 73).

Using the Tool

The Field Mapping Tool Window

The *Field Mapping Tool* window is divided into three sections: **Source Database**, **Destination EDM Database**, and **Mapping Properties**. This window allows the user to view or change legacy database mappings.



Located at the top of the Field Mapping Tool window are the following fields: **Database Type**, **Application**, and **Mapping Set**. These fields display the choices made during the connection and application selection.

Source Database Area

This area displays the legacy database tables and column names for the selected application (e.g., DIMS, COMPASS, or WELLPLAN). The database is displayed in a selection tree of tables and fields (columns) within those tables. A folder icon represents a Table, and a file icon represents a Field Name (column name). To display a table and all the fields within that table, select the expand (+) icon located to the left of the table folder.

Source Database fields that have been mapped to the EDM database are highlighted in green. Non-mapped fields are not highlighted. Mapped field data will be migrated to the EDM database; unmapped data will not be migrated. For the default mapping sets provided with the EDM database, non-mapped fields are usually internal key fields that do not need to be migrated, as they are replaced by equivalent key fields in the EDM database. There are also many cumulative/calculated fields that are not being migrated. Cumulative and calculated fields are not stored in the EDM Database, as applications update these fields when data is entered.

EDM Database Area

This area displays the EDM database contents to which the legacy data fields are mapped.

The database is displayed in a selection tree of tables and fields (columns) within those tables. A folder icon represents a Table, and a file icon represents a Field. To display a table and all the fields within that table, select the + icon located to the left of the table folder.

> **Note:**
>
> Currently there is no functionality to allow for the expansion of all tables in the Database sections using a single command. Instead, select each table to be expanded and select the +.

Double-click on a green, bold, field in the Source Database or EDM Database section to view the mapped table and field name in the other database section. If there is more than one corresponding field, a dialog will appear prompting for a specific field. This occurs when a legacy data field is migrated to more than one location in the EDM database, or more than one legacy source is migrated into one target area in the EDM database. For example, DIMS Casing Components and BHA Components are mapped into one common place in EDM: Assembly Component.

Mapping Properties Area

The Mapping Properties area is where options for the current mapping may be edited.

The following table provides descriptions of all the fields contained in the Mapping Properties area of the Field Mapping Tool window.

Field Name	Description
Mapped	Activating this checkbox indicates that the selected legacy and EDM fields should be mapped. It also activates the value fields as well as the Comments, Group Name, and Active fields, making them available for data entry or modification of information that already exists. Deactivate the Mapped checkbox and click **Apply** to remove a mapping. See "Remove Mappings from a Mapping Set" on page 69.
Select value	This field contains a SQL SELECT clause parameter. The output from this parameter must contain SQL that is compatible with the database that owns the staging area schema. For basic one-to-one mappings, this value should simply contain the name of the source field. To avoid ambiguity, field names must be in the following syntax: **table_name.field_name** (e.g., EDM_SA.WELLHEAD.well_common_name). If the target field is a parent key, then the **Select value**, **From value**, and **Where value** fields must contain SQL with a special syntax. See "Link Tables" on page 55.
From value	This field contains a fragment of a SQL FROM clause. For basic one-to-one mappings, this value should reference the table containing the field referenced by **select_value**. Any reference to tables in the staging area should be prefixed with "**EDM_SA**." (Example: EDM_SA.TABLE1). Redundant values in a mapping group are ignored. If the target field is a parent key, then the **Select value**, **From value**, and **Where value** fields must contain SQL with a special syntax. See "Link Tables" on page 55.
Where value	This field contains a fragment of a SQL WHERE clause. Specify any desired joins between tables used in the **From value** field. Using any conditions that limit the result of the query may result in loss of data. Redundant values in a mapping group are ignored. If the target field is a parent key, then the **Select value**, **From value**, and **Where value** fields must contain SQL with a special syntax. See "Link Tables" on page 55.

Field Name	Description
Comments	This field is used to document changes or modifications in the mapping. This documentation may become important in explaining a SQL statement, and could be used as background if changes to the mapping are being considered.
Group Name	This field is used to group together fields within a table that will be transferred together. When a common name is used between a set of mappings, the data migration process combines the **select/ from/where** fragments together. A group of mappings must all map to the same target table.
Active	Activate this checkbox to allow the mapping displayed to run during the data migration. A mapping can be temporarily removed from a data migration by deactivating this checkbox. This checkbox may also be deactivated if a user needs to map two fields together for the purpose of unit conversion, but the data is to be moved with a different group. (For example; DIMS datums are moved via a temporary table constructed during migration, but the elevation fields are all mapped to DATUM, datum_elevation for proper unit conversion. By default this checkbox is activated.

Link Tables

Link tables are temporary tables created in the EDM schema by the data migration process to facilitate the translation of legacy keys to EDM keys. A link table is created for each EDM field that is a parent key.

The link table's name is the target field's field_name prefixed with "L_". Every link table has three columns: source_key, target_key, and use_count. The source_key's data type matches the data type of the source field. The target_key column is always VARCHAR, which is a common datatype used in EDM to store keys. The use_count column is used to monitor instances of run SQL or JQL (Java + SQL) scripts when tables are transferred more than once due to errors. The link tables are populated with the original source keys and the new EDM keys.

Key mappings must use a specific syntax for the **Select value**, **From value**, and **Where value** fields to pull the EDM keys from the respective link table.

- **Select value** must contain the name of the link table followed by ".target_key". (Example: L_WELL_ID.target_key)
- **From value** must contain the name of the link table and the name of the source table prefixed with "EDM_SA.". (Example: L_WELL_ID, EDM_SA.WELLHEAD)
- **Where value** must contain a join between the link table's source_key field and the associated field from the source table prefixed with "EDM_SA." and the source table name. (Example: L_WELL_ID.source_key = EDM_SA.WELLHEAD.wellid)

Click **Apply** to save the mapping displayed in the **Mapping Properties** section.

An example of SQL or JQL for a mapping is as follows:

Select L_WELL_ID.target_key From L_WELL_ID, EDM_SA.WELLHEAD Where L_WELL_ID.source_key = EDM_SA.WELLHEAD.wellid

Viewing Migration SQL

To view the SQL that is a result of a group of mappings prior to the migration:

Select the table containing a mapped field in the EDM database tree or select a table in the legacy data set to locate the mapped field in the EDM database.

Follow the menu path **View > Migration SQL**.

A dialog appears displaying the insert statement(s) for the selected table in SQL. The statement will display the EDM database table, followed by the columns in that table which have been mapped to columns in the Source database, and Link tables created during the migration process. This is followed by the Select, From, and Where key mappings used to pull the EDM keys from the respective link table.

Main Menubar Commands

Action > Export...

Use this command to export the mapping set to SQL script which can be imported into another database.

Action > Exit

Use this command to exit the Field Mapping Tool.

View > Migration SQL

Use this command to view the mapping sets prior to migration of the data to the EDM database.

View > Mapped Tables Only

This command displays only those tables containing fields that have been mapped. Using this command will reduce the number of table folders that appear in the hierarchy. If, however, some fields in a table are mapped, all fields will be displayed (including any that are not mapped). When this command is activated a checkmark will appear next to the command.

Options > Scripts...

Use this command to add, edit, or remove pre- or post-data transfer SQL or JQL scripts from the current mapping set. The purpose of the script is to allow modification of legacy data or EDM data using SQL or JQL (Java + SQL). This would be necessary if a data migration requirement is not achievable with mappings.

Picklist Table Owner Post Migration Script

The GrantRightsToPicklist.sql script run during the Post Migration will grant SELECT, INSERT, UPDATE, DELETE to the table owned by Picklist Home user, as defined in the Data Migration Tool to edmrole.

If the user does not wish to have the migration run this script and will grant the rights manually, select the post migration script “GrantRightsToPicklists.sql” (marked as the 8th script to run in the post migration) and click the **Remove** button.

Options > Targets...

Use this command to match data sets to the data model. This command will only be used if a new data model is released by Landmark Graphics Corporation. Using the command will open the Target metadata window. A dropdown picklist allows the user to select options for the data set comparisons.

Help > Using the Data Migration Toolkit

Use this command to launch Adobe Acrobat to make this documentation available in .PDF format from the Field Mapping Tool.

Help > About

Use this command to view information on the application such as version number and copyright date.

Procedures

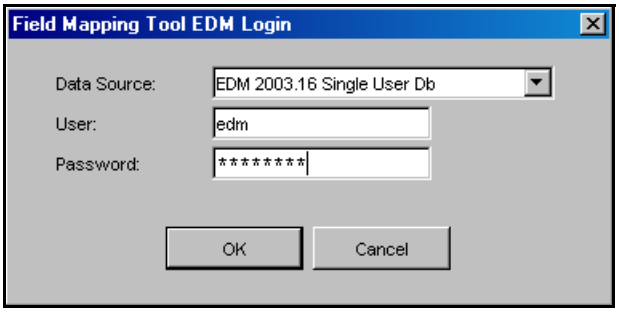
Mapping Sets

View Current Mapping Set

1. To access the Field Mapping Tool window, follow the menu path:

   Start > Programs > Landmark Engineer's Desktop 5000.1 > Tools > Drilling Field Mapping

   The *Field Mapping Tool EDM Login* dialog box appears.

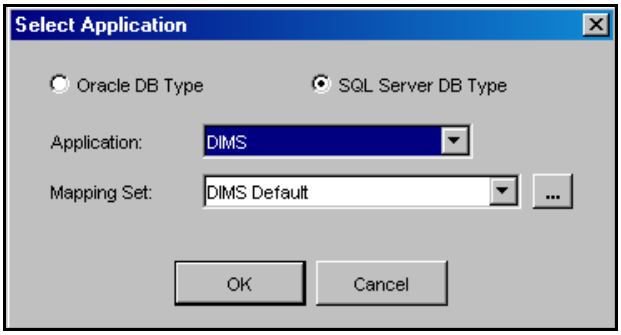


2. Using the dropdown picklist, select the **Data Source** (name of the configured EDM database). The default name for a SQL Server 2005 Express database is 'EDM 5000.1 Single User Db'. This is the SQL Server 2005 Express EDM database that is created during the Engineer's Desktop software installation. If an Oracle database is used, the EDM DSN will be defined by the administrator creating the ODBC data source.

3. Enter the username and password in the fields provided. The default SQL Server 2005 Express database username and password is '*edm*' and '*Landmark1*'.

4. Click **OK**.

The *Select Application* dialog box appears.



5. Select the type of database; Oracle, or SQL Server for SQL Server 2005 Express databases.

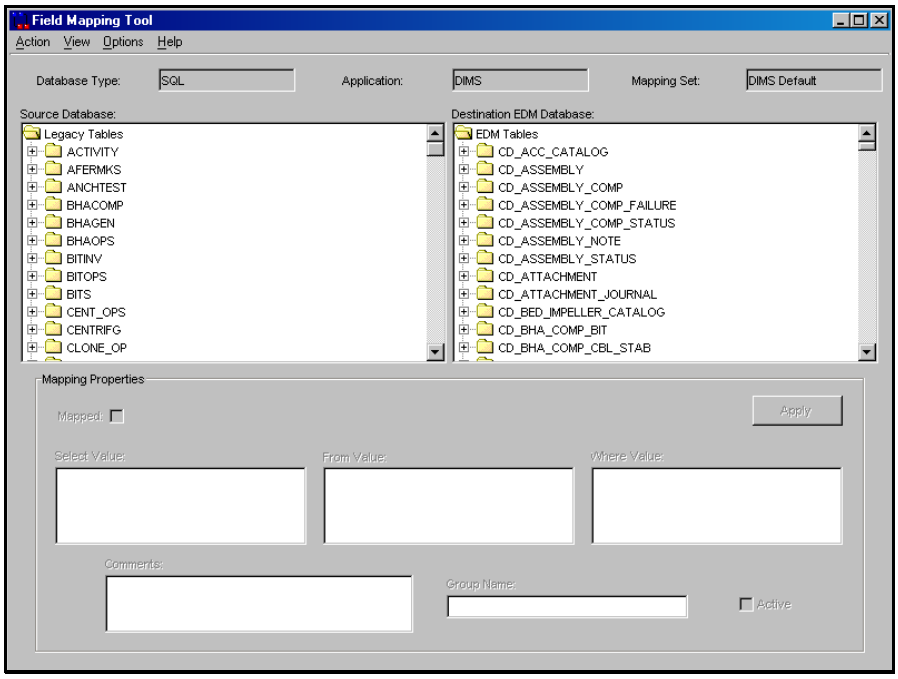
6. Using the **Application** dropdown picklist, select the application from which the legacy data will be mapped.

   The **Mapping set** field will default depending on the application chosen in the previous field. If no changes are made to the **Database Type** and **Application**, click the **Application** field to populate the **Mapping Set** field. The 5000.1 Engineer's Desktop software release provides mapping sets for DIMS, COMPASS, and WELLPLAN applications.

> **Note:**
>
> The legacy application databases must be W2000 COMPASS, W2000 WELLPLAN, DIMS 2003.0, or DIMS 2003.0.1. Previous versions of COMPASS, WELLPLAN, and DIMS databases must be upgraded to a supported legacy database version before migrating to the EDM database. W2000 database upgrade utilities are available from the W2000 Release CD. DIMS database upgrades can be found in the Engineer's Desktop 5000.1 download in \Products\DIMS-DB-Upgrades\Previous Database Updates.

7. Click **OK**.

The *Field Mapping Tool* window appears.



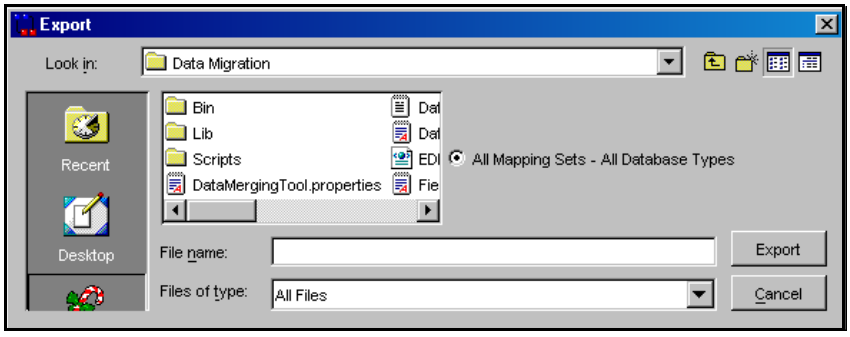
All database tables available are displayed in both the **Source Database** and the **EDM Database** sections.

Export the Mapping Set

1. From the Field Mapping Tool window, follow the menu path:

   Action > Export

   The *Export* dialog box appears.



2. Use the dropdown picklist in the **Look in** field to select a location for the exported file.

3. Enter a name for the exported file in the **File name** field.

4. Click **Export**.

   A second Export dialog box will appear containing the following message, *"Export finished."*

5. Click **OK** to return to the Field Mapping Tool window.

6. The file can now be opened as a SQL script or imported to another database.

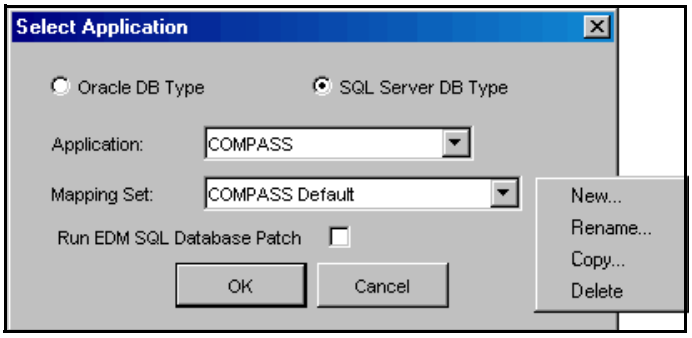
Copy a Mapping Set

Use this feature to copy a mapping set that currently exists.

1. From within the Select Application dialog box, use the **Application** dropdown picklist to select the application containing the field mapping set to copy.

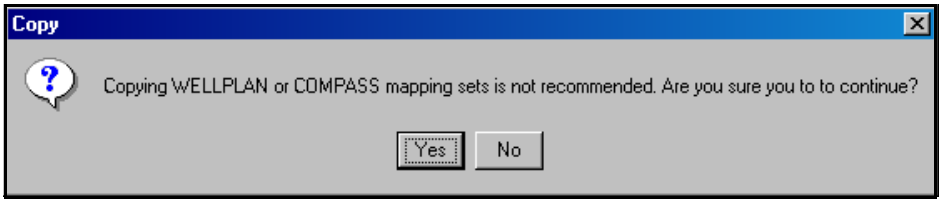
   The **Mapping set** field defaults depending on the application chosen in the previous field. To copy the current mapping set, click ... .

   A menu appears to the right of the *Select Application* window.



2. Select **Copy...**

   If COMPASS or WELLPLAN applications have been selected, the following warning appears.

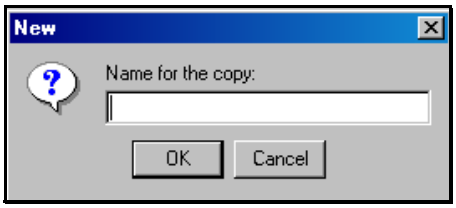


3. Select **No** if you do not want to copy an existing Mapping set.

   Or

   Click **Yes** to continue.

   The *New* window appears.



4. Enter a name for the copy being created and click **OK**.

   The Select Application window reappears.

   The new name appears in the **Mapping set** field.

5. Click **OK**.

   The Field Mapping Tool Window appears.

   Changes can be made to the copy of the mapping set by adding or removing mappings.

See “Add Mappings to Mapping Set” on page 67.

See “Remove Mappings from a Mapping Set” on page 69.

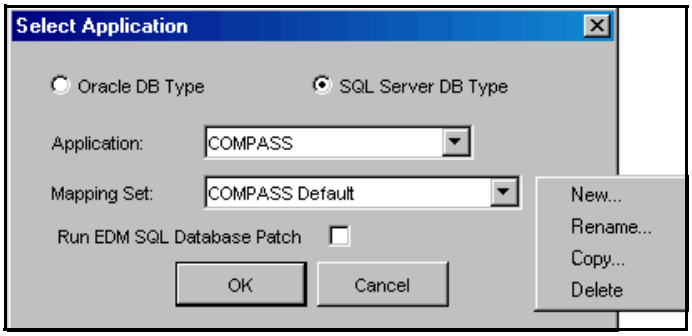
Rename a Mapping Set

Use this feature to rename a mapping set that currently exists.

1. Use the **Application** dropdown picklist in the **Select Application** window to select the application from which the mapping set is to be renamed.

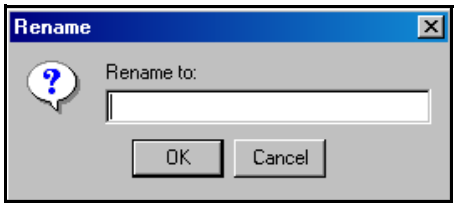
   The **Mapping set** field defaults depending on the application chosen in the previous field. To rename the current mapping set, click ... .

A menu appears to the right of the *Select Application* window.



2. Select **Rename...**

   The *Rename* window appears.



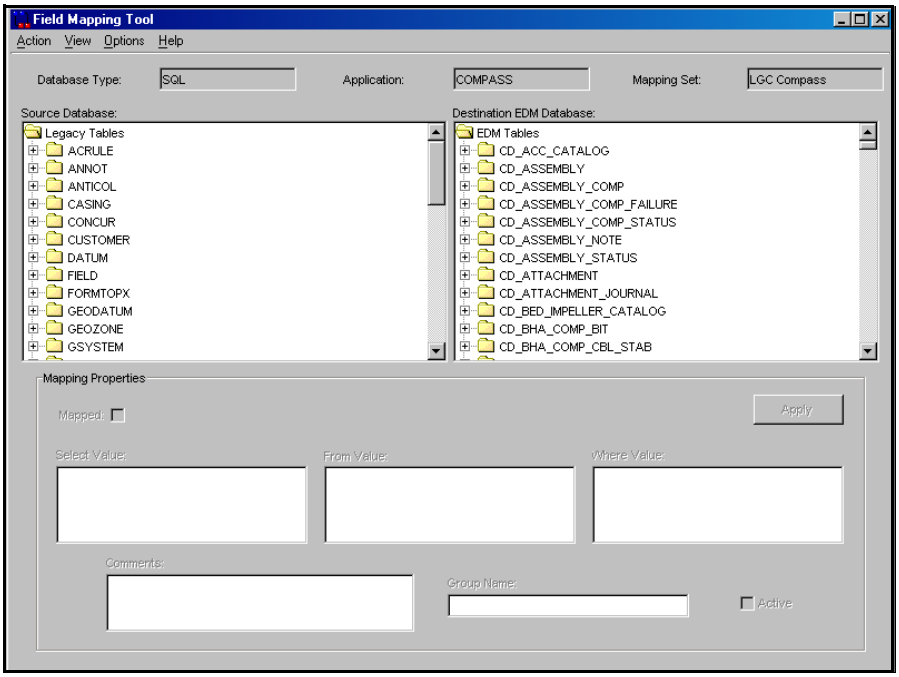
3. Enter the new name for the mapping set (e.g., *LGC COMPASS*). Click **OK**.

   The Select Application window reappears.

   The new name appears in the **Mapping set** field.

4. Click **OK**.

The *Field Mapping Tool* window appears. The new name is displayed in the **Mapping Set** field.



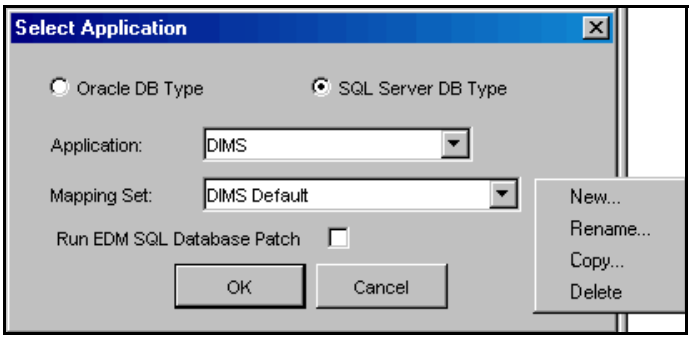
Create a New Mapping Set

> **Important:**
>
> This feature would rarely be used, because creating a mapping set is a complex undertaking. If changes must be made to a mapping set it is best to copy an existing mapping set.

1. Use the **Application** dropdown picklist in the **Select Application** window to select the application for which the new mapping set is to be created.

   The **Mapping set** field will default depending on the Application chosen in the previous field. To create a new mapping set, click ... .

A menu appears to the right of the *Select Application* window.



2. Select **New...**

   The *New* window appears.

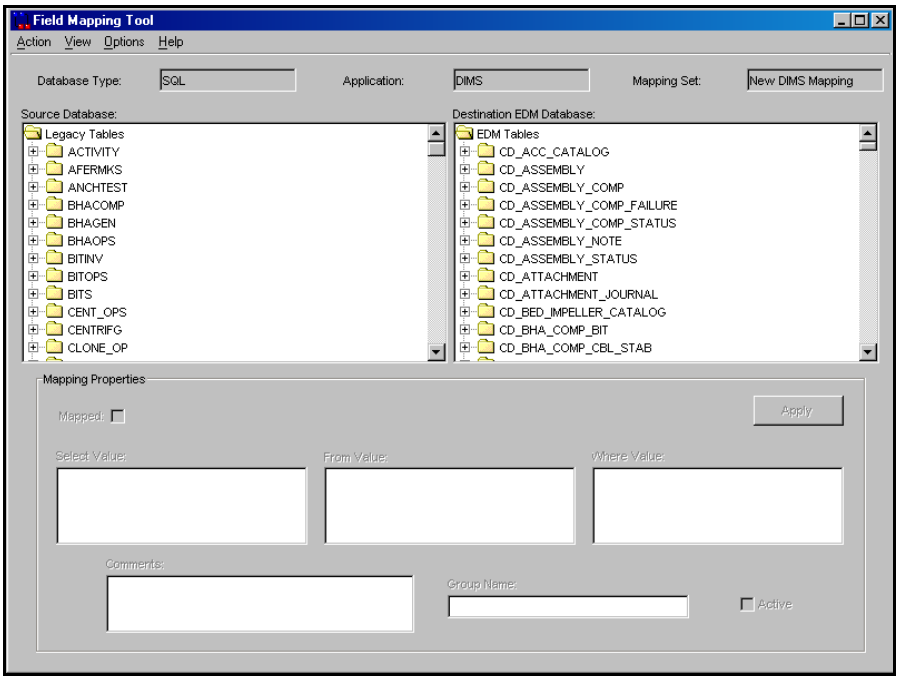
3. Enter the name for the new mapping set (e.g., *New DIMS Mapping*). Click **OK**.

   The Select Application window reappears.

   The new name appears in the **Mapping set** field.

4. Click **OK**.

The *Field Mapping Tool* Window appears.



The new mapping set is should then be populated by defining mappings.

Add Mappings to Mapping Set

To map data fields from the legacy database to the EDM database, use the following instructions:

1. Navigate to and select the field to be mapped in the **Source Database** section.

2. Navigate to and select the corresponding field in the **EDM Database** section.

   The selected information (legacy table and field) in the **Select Value** field and the selected information (EDM table and field) in the **From Value** field of the **Mapping Properties** section appear greyed out.

3. Select the **Mapped** checkbox to activate these fields.

> **Warning:**
>
> The Field Mapping tool does not check mapped sets for incompatible data types, character length comparisons, etc.

4. To add a condition to the mapping click in the **Where Value** field and enter the statement (e.g., a join between two tables from the legacy database that will be contained in one table in the EDM database). This SQL statement will run during the data migration.

> **Note:**
>
> Use the menu path **Options > Scripts...** to add, edit, or remove pre- or post- data migration scripts from the current mapping set. The purpose of the script is to allow modification of source data, or EDM data using SQL. This would be necessary if a data migration requirement is not achievable with mappings.
>
> See “Run Pre-Migration SQL or JQL Scripts” on page 70.
>
> See “Run Post-Migration SQL or JQL Scripts” on page 71.

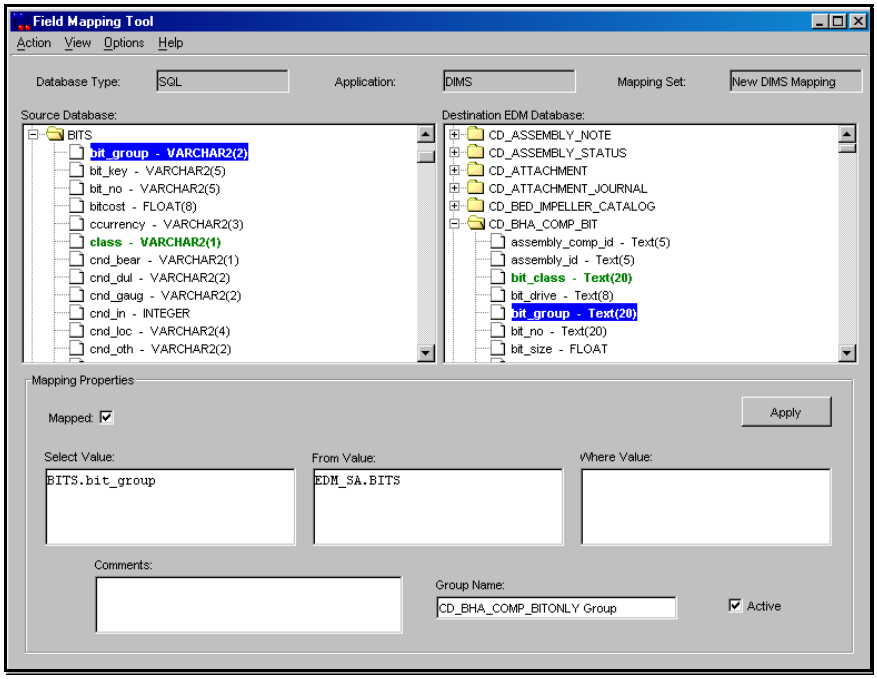
5. Enter text in the **Comments** field to describe changes or modifications in the mapping. This description entered here may become important to explain the statement if a change to the mapping is being considered.

6. Enter the new name for the table in the **Group Name** field. The group name is used to group together fields within a table that will migrate collectively.

7. Select the **Active** checkbox to allow the mapping to run during the data migration. A mapping can be temporarily removed from a data migration by deselecting the Active checkbox.

8. Click **Apply** to save the mappings.

   The fields in the **Source Database** and the **EDM Database** sections are now highlighted in bold, green text. This indicates the fields are mapped.



Note:

Double-click on a bold, green field located in either the **Source Database** or **EDM Database** section to view the corresponding table and field name in the other section.

It is possible to map one field to many fields using the Field Mapping Tool. This will occur when data from one field in the source database should be migrated to multiple fields in the EDM database.

However, the opposite is *not* true except in cases of concatenation. Many fields in the source database cannot be mapped to one field in the EDM database. Although the Field Mapping Tool will allow many to one relationships to be included, the data migration itself will be unsuccessful. An example of a concatenated exception is *EDM_SA.BITS.bit_group + EDM_SA.BITS.bit_no*.

Remove Mappings from a Mapping Set

To remove mapped fields, use the following instructions:

1. Navigate to and select the legacy field and corresponding EDM field to be removed from the **Source Database** section and the **EDM Database** section. This can be done by clicking on the legacy database field.

2. Deselect the **Mapping** checkbox and click **Apply**.

3. The mapping selected will no longer be available. The fields for the removed mapping will no longer appear highlighted in bold, green text. Any information stored with the mapping will be lost.

Run Pre-Migration SQL or JQL Scripts

Pre and Post-transfer SQL or JQL scripts are used to manipulate the data during the data migration process. Pre-migration SQL or JQL scripts adjust data in the staging area prior to being migrated into EDM tables. Post-migration SQL or JQL scripts adjust data after it has been migrated into the EDM tables.

> **Important:**
>
> These SQL or JQL scripts must be edited/created manually by knowledgeable Database Administrators or data migration team members.

To run a SQL or JQL script prior to the data migration, use the following instructions:

1. Follow the menu path:

   Options > Scripts...

   The Scripts dialog box appears.

2. Click **Add**. A new line appears in the scripts table.

3. Enter the **Filename** of the SQL or JQL script.

> **Note:**
>
> The files for pre- and post-migration SQL or JQL scripts for DIMS, COMPASS, and WELLPLAN data migration default scripts are located under the application's home directory on the computer's hard drive. A script can be added from any location on the hard disk (e.g., C:\Landmark\EDT_5000.1\EDM\Data Migration\Scripts).

4. Use the dropdown picklist in the **Executed** column to select **Pre-transfer**.

5. Enter an order number in the **Order** column. This determines the order in which the pre-transfer SQL or JQL scripts run.

6. Click **OK**.

Run Post-Migration SQL or JQL Scripts

To run a SQL or JQL script after the data migration process, use the following instructions:

1. Follow the menu path:

   Options > Scripts...

   The Scripts dialog box appears.

2. Click **Add**. A new line appears in the scripts table.

3. Enter the **Filename** of the SQL or JQL script.

> **Note:**
>
> The files for pre- and post-transfer SQL or JQL scripts for DIMS, COMPASS, and WELLPLAN data migration default scripts are located under the application's home directory on the computer's hard drive. A script can be added from any location on the hard disk.

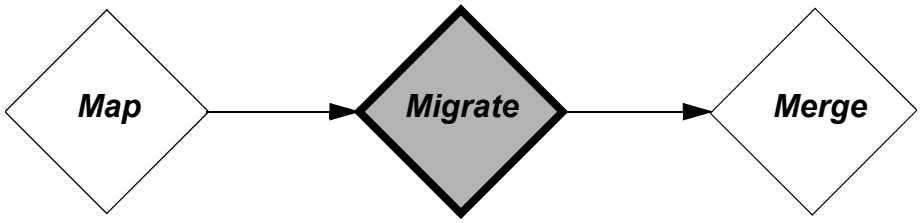
4. Use the dropdown picklist in the **Executed** column to select **Post-transfer**.

5. Enter an order number in the **Order** column. This determines the order in which the post-transfer SQL or JQL scripts run.

6. Click **OK**.

Drilling Data Migration

Overview



The Drilling Data Migration tool allows the database administrator or client implementation team to migrate data from legacy DIMS, COMPASS, and WELLPLAN databases to the EDM database. Migrations from one or more legacy databases may be performed in a single data migration session.

Data Migration Preparation

The Data Migration of DIMS™ legacy data to the EDM™ database requires a number of quality checks to ensure the migration will run smoothly. In order to complete these quality checks using the tools Landmark has provided, DIMS software must be installed on the machine preforming the quality checks. For details of the DIMS quality checks see “Steps for DIMS Data - Pre-Migration” on page 13.

Multiple data migrations may occur to a single EDM database, so that it contains all the legacy data required by the Engineer’s Desktop 5000.1 applications. Duplicate data can be resolved later using the EDM Data Merging tool.

Before the Drilling Data Migration tool is used, it is important to ensure that all data from legacy systems has been located. Data must be collated into a migration database prior to moving it over to the EDM database.

An efficient method for migrating multiple COMPASS/WELLPLAN databases is to use migration files to merge all data into one database prior to migrating it to the EDM database. For further information on migration files, see the COMPASS W2000 online help file topic **Transfer File**. This help topic can be located through the Table of Contents page by selecting **How do I...** and scrolling down to **Export/ Import Data** and selecting ‘COMPASS to COMPASS migration’**.**

Once all data to be migrated has been collected into one or more legacy databases it can then be migrated to the EDM database. It is important to keep in mind that all data moved within a legacy database within a session MUST have the base storage units (i.e. API or SI).

COMPASS Post-Migration

COMPASS 2000 data is required for comparison against the migrated data in the “COMPASS Post Migration Steps” on page 139.

Apply the most recent COMPASS 2000 patch and launch the application to recompute all definitive paths. Generate the Well Coordinates file, which will be used in the comparison after the migration.

The migration of data occurs once the field mappings have been verified (see “Drilling Field Mapping” on page 49). The Data Migration Tool moves through a seventeen step process in order to complete the migration of data from the legacy database to the EDM

database. After using the Data Migration Tool the Data Merging process must be completed to ensure there is no duplicate data present in the EDM database. (See “EDM™ Data Merging” on page 115).

Important!

If your EDM database is running in Oracle it must be configured before running the Data Migration Tool. Please review “Appendix A: Configuring the Data Migration Toolkit” on page 153 prior to running the data migration.

DIMS Pre-Transfer Preparation - QA

In order to ease the migration of DIMS data it is important to take steps prior to the migration step to clean up data in the DIMS database and ready it for the data migration. The procedures that must be performed by the DIMS System Administrator prior to the migration of data are outlined in “Steps for DIMS Data - Pre-Migration” on page 13.

Data Migration Purpose

The Data Migration Tool

The Data Migration Tool is used to migrate data from the legacy database to the EDM database.

Using the Data Migration Tool, the migration of data from the legacy database to the EDM database can occur in one of two modes;

- **Interactive**

  The interactive mode displays a configuration window to allow the database administrator to choose specific options for the data migration.

- **Automatic**

  The automatic mode does not display the login dialog, nor the Data Migration window. It can be run from Command prompt or by editing the DataMigrationTool.bat file. The command line arguments necessary to run in automatic mode are as follows:

Argument	Description
-auto	Determines that the data migration will occur in automatic mode.
-application NAME	Specifies the name of the application which owns the data set to be migrated.
-mappingset NAME	Specifies the name of the “mapping set” to use for the data migration.
-legacy DSN [USER [PASS]]	The data source name, username, and password for the ODBC connection to the source database. **Note:** The username and password are optional as some legacy databases may not require either.
-legacyunits DSN [USER [PASS]]	The data source name, username, and password for the ODBC connection to the source database units - UMS. **Note:** The username and password are optional as some legacy databases may not require either.

Argument	Description
-system DSN [USER [PASS]]	If the data source is from a DIMS database, this information is required.
-edm DSN USER PASS	The data source name, username, and password for the ODBC connection to the EDM database.
-force	This argument is used if more than one database is being migrated to the target in one session. Using this argument forces the migration to run. It is applicable when a data source has been run already in the session. This argument is used by the automatic migration and it mimics the dialog box allowing the user to choose to rerun a migration in the interactive mode.

An example of an automatic data migration is as follows:

From the Command line change the directory to the Data Migration home directory (e.g., C:\Landmark\EDT_5000.1\Data Migration) and enter the following:

```
start javaw.exe -Dsun.java2d.noddraw -classpath
"lib\DataTransferTool.jar;%CLASSPATH%" -auto -
application COMPASS - mappingset “COMPASS default”
-legacy “CFW 2000.0 Single User Db” dba sql -
legacyunits “CFW 2000.0 UMS Single User” dba sql -
edm “EDM 5000.1 Single User Db” EDM landmark
```

Note:

COMPASS and WELLPLAN applications on the EDM database will not automatically update data upon start-up of the application. Data must be migrated as a separate process.

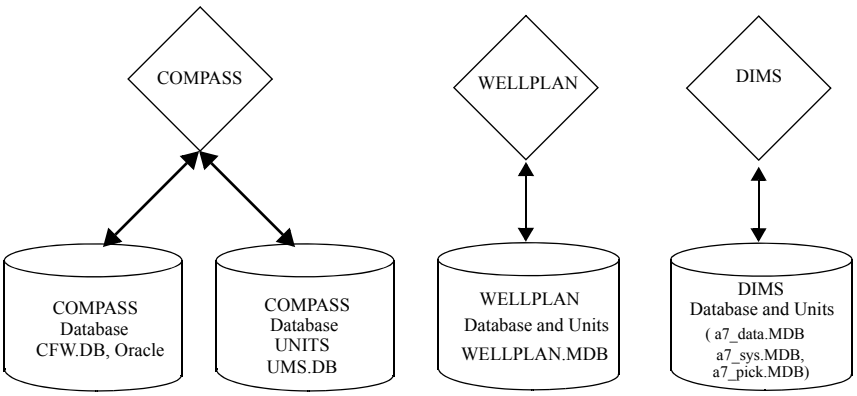


Figure 3: Data from DIMS, COMPASS, and WELLPLAN applications before using the Data Migration Tool.

The migration of data from the DIMS, COMPASS, and WELLPLAN databases to the EDM database places all of the data—previously existing in three separate databases— in one location.

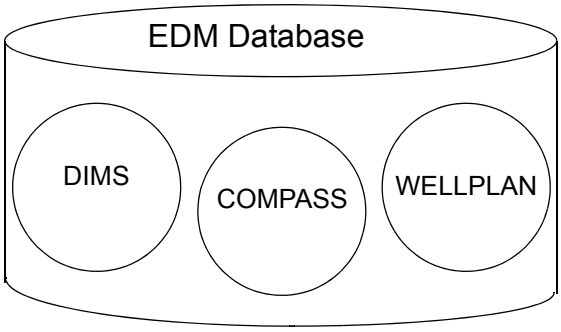


Figure 4: Data from the DIMS, COMPASS, and WELLPLAN applications after using the Data Migration Tool.

The Data Merging Tool is used to merge common data between the three applications in the EDM Database so that data from the DIMS, COMPASS, and WELLPLAN applications share a common data hierarchy (see “EDM™ Data Merging” on page 115).

Using the Tool

Important!

SQL Server authentication must be used for the migration to run without errors.

If Windows NT authentication is used the staging tables will not be built during the migration process resulting in an error.

The Migration Tool Window

Application Setup

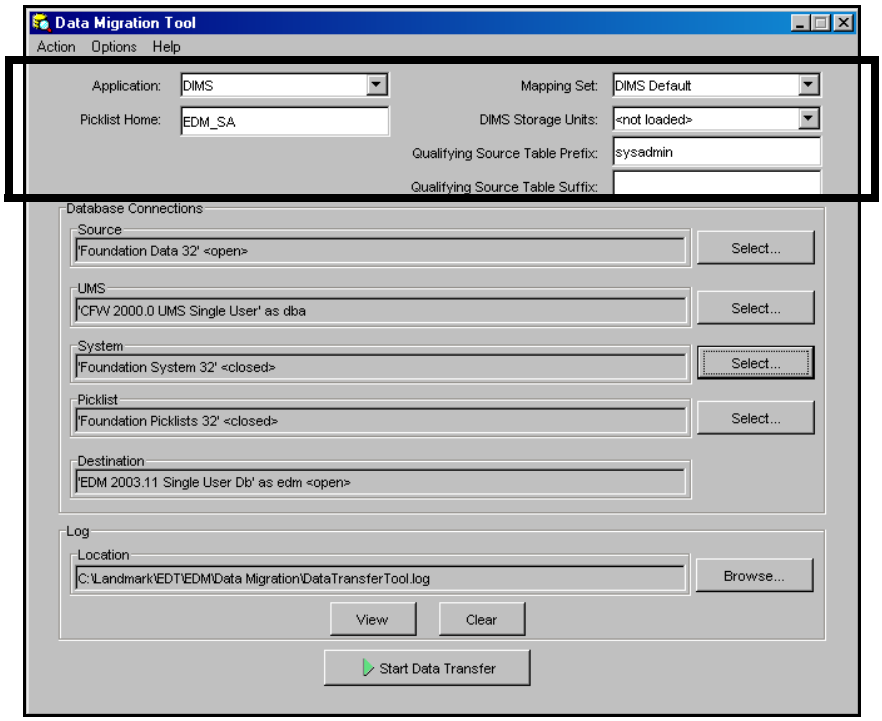


Figure 3: The Data Migration Tool window.

Located at the top of the Data Migration Tool window are the **Application** dropdown picklist and the **Mapping Set** dropdown picklist. These fields allow the database administrator to select the application source database (COMPASS, WELLPLAN, or DIMS) to

migrate, and the mapping set used for the data migration for that application data set.

The **Picklist Home** field is used to define the schema owner of the client controlled picklists. This is the schema where the tables in the a7_pick.MDB will be moved to during the migration. This field is only used for DIMS data migrations. *EDM_SA* is the default picklist schema owner.

Picklist Schema Owner

If the client intends to migrate their picklists and picklist configurations from DIMS:

- the picklist schema owner should be set to "*PK"* (or another valid schema to place them in another area) in the **Picklist Home** field,
- and the *createcustompicklistentries.sql* should be run in post migration.

If the client intends to use their DIMS picklists, note that a standard set of PK_ tables owned by PK will be removed during the migration.

If the client does NOT intend to use their DIMS picklists:

- the picklist schema owner should be set to the default value of *"EDM_SA"* in the **Picklist Home** field,
- the client should NOT choose to load picklist metadata,
- and the client should remove the *createcustompicklistentries.sql* from the EDT_5000.1\EDM\data migration\scripts\dims folder.

If 'DIMS' is selected in the **Application** field, the **DIMS Storage Units** field becomes available only after the UMS data source is selected. Use this field to select storage units for the DIMS database, either **SI** or **API**. This field is automatically populated with options for selection once the **UMS** (in the Database Connections area) has been selected.A UMS database is installed by the Engineer's Desktop™ software in the following folder: EDT_5000.1\EDM\Data Migration\Lib.

It is possible for some database server types to specialize access to tables. Tables can be accessed remotely, through views, in distinct schemas, or through public or private synonyms. The generic syntax is "[db-product-specific-prefix]<table-name>[db-product-specific-suffix]", where both the prefix and suffix are optional. This is used during the configuration test and the staging of source/legacy database tables. Prefixes may be used to define the table owner and/or prefix names. The suffix is used to define a single suffix used for all DIMS database table names.

- Prefix - Enter a prefix in the **Qualifying Source Table Prefix** field and press the **Enter** key. (**Note:** Failing to press **Enter** on the keyboard could cause the Migration to fail.) If no prefix is desired remove the default prefix from the field. The default value is the "<source-db-user>".

> Migration of DIMS data on Oracle
>
> When logging into the DIMS data source as the table owner, in the prefix field enter either the table owner plus prefix (e.g., dims_owner.DIMS) or the prefix alone (e.g., DIMS_).
>
> When logging into the DIMS data source as a user that *does not* own the DIMS tables, the path must be fully qualified; use the schema owner and the prefix (e.g., dims_owner.DIMS_ or "dims_admin.DIMS_DATA_).

- Suffix - Enter a suffix in the **Qualifying Source Table Suffix** field. The default value is blank.

Prefix/Suffix Examples:

- dfw_OWNER.Wellist - where ‘dfw_OWNER’ is the source database table owner as defined in Oracle, and ‘Wellist’ is the table name.

- dfw_OWNER.t_Wellist - where ‘dfw_OWNER’ is the source database table owner as defined in Oracle, and ‘t_Wellist’ is the modified DIMS table name with ‘t_’ as the prefix. This database would also require some form of view or synonym called ‘Wellist’ for DIMS software to run.

- dfw_OWNER.Wellist_Tab - where ‘dfw_OWNER’ is the source database table owner as defined in Oracle, and ‘Wellist_Tab’ is the modified DIMS table name with ‘_Tab’ as the suffix. This database would also require some form of view or synonym called ‘Wellist’ for DIMS software to run

- dfw_EDIT.Wellist - here ‘dfw_EDIT’ is the source database view owner as defined in Oracle as a synonym, and ‘Wellist’ is the synonym name.

The Database Connections

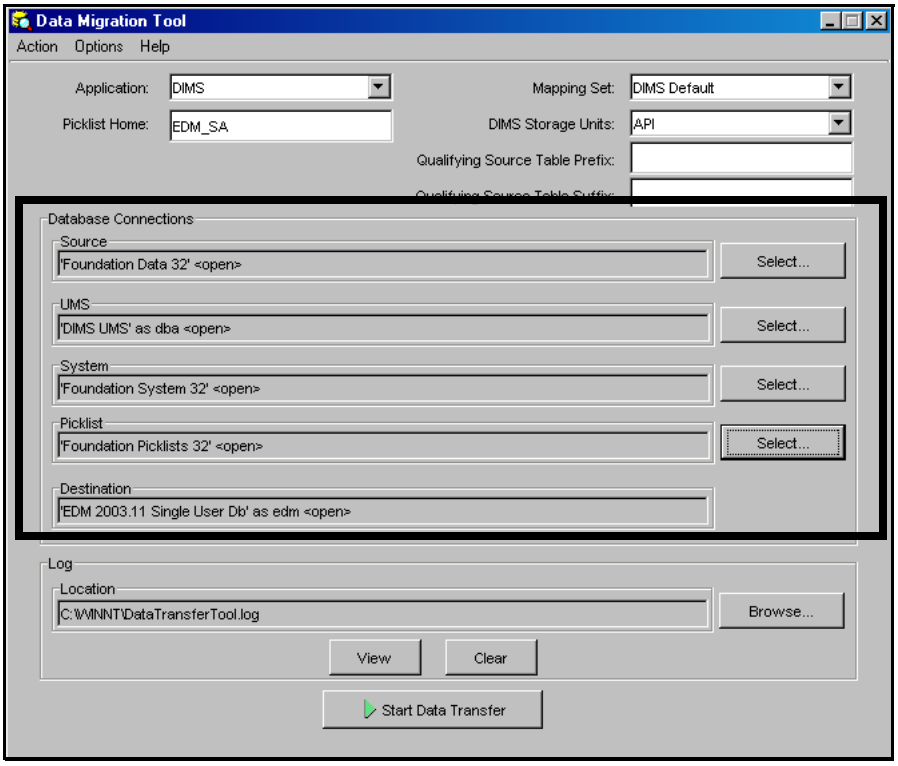


Figure 4: The Database Connections area in the Data Migration Tool.

This area allows the database administrator to select connection parameters (i.e., user and password) for the source database to be migrated.

The **Source** field is used to select the source database ODBC connection (e.g., COMPASS = CFW 2000.0 Single User) to be migrated.

The **UMS** field is used for database selection (e.g., CFW 2000.0 UMS Single User). If a WELLPLAN database is chosen the message *'(ums not applied for WELLPLAN)'* appears in the **UMS** field. For DIMS software, this ADBC source should point to UMS.MDB which is installed with the EDM database.

The **System** field is only available when a DIMS database is selected as the source.

The **Picklist** field is used to select a data source for the DIMS picklists.

Click **Select**, located at the end of the **Source**, **UMS**, **System**, and **Picklist** fields, to access the **Select Database** window for each of these fields.

The **Destination** database (e.g., *'EDM 5000.1 Single User Db' as edm*) is displayed based on the user's login to the Data Migration Tool.

Note:

Both COMPASS and DIMS applications have a separate units database— for WELLPLAN data migration, the **UMS** field will not be available.

The COMPASS legacy units database is named UMS.db and is typically associated with the DSN; for example, "CFW xxxx.x UMS Single User" where xxxx.x is the version number.

Previous versions of DIMS software did not have a separate units database. A units database for DIMS software is only used for the migration of its data to an EDM database.

All of the information gathered in the Database connection area allows the Data Migration Tool to connect to the Source, UMS, System, Picklist Data, and Destination EDM databases at the beginning of the migration process.

Log

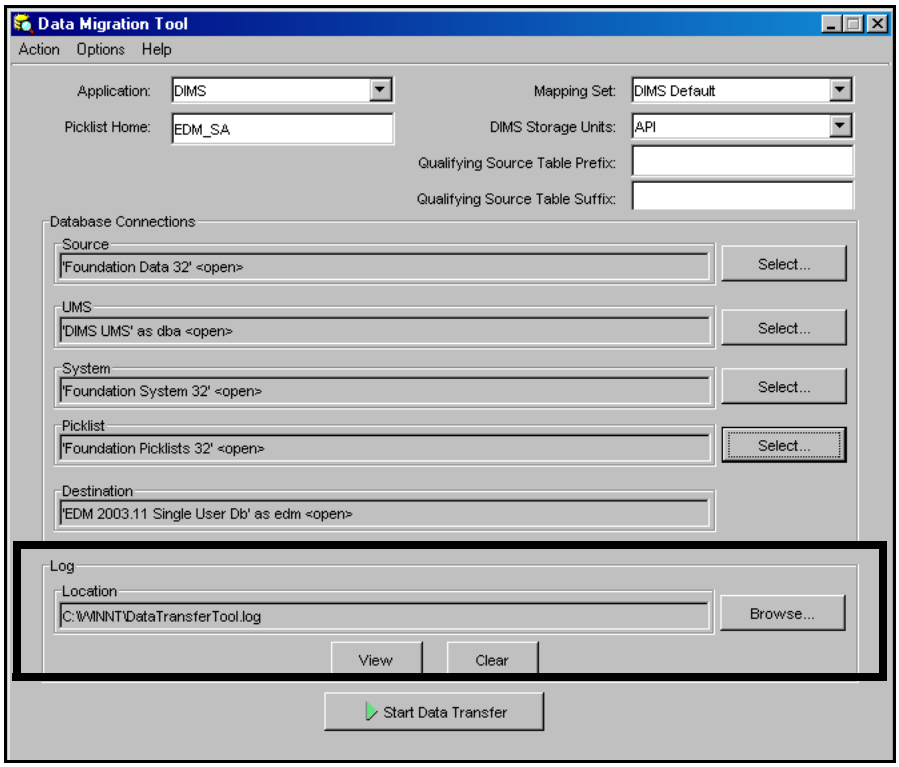


Figure 5: The Log area in the Data Migration Tool.

This section contains the location of the log file, which is created and populated during a data migration. To change the default location of this file, click **Browse** and navigate to a new location for the log file. To view the log file, click **View** and to clear the log file contents, click **Clear**. The log file is useful for troubleshooting the migration process, or confirming a successful, error-free data migration. If problems occur during a data migration, the log file should be provided to Landmark Support when the problem is reported.

Start Data Transfer

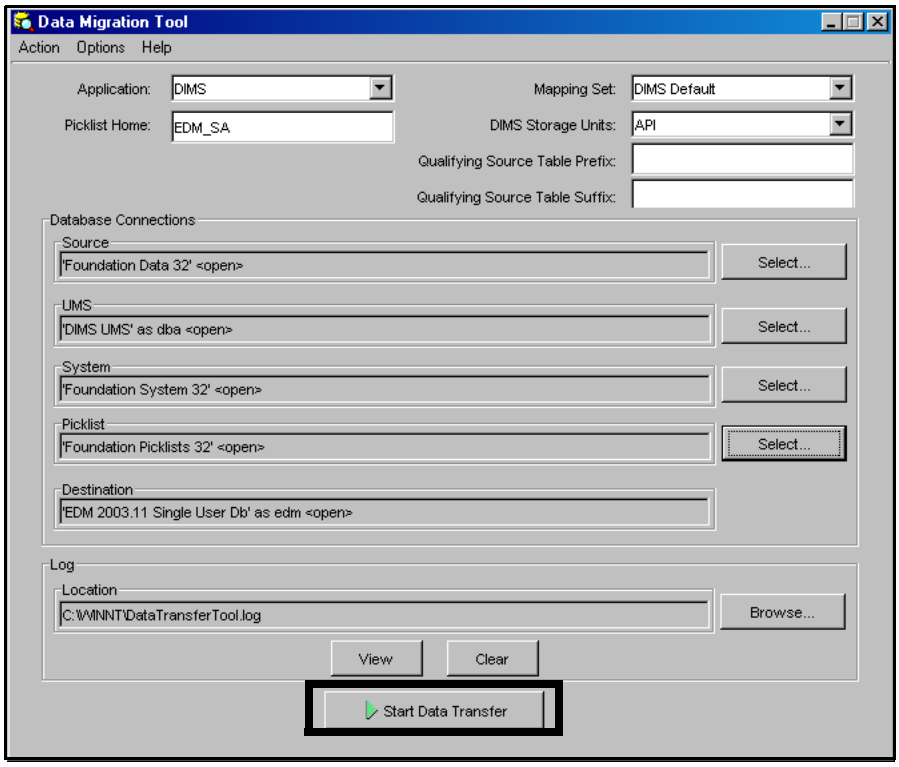


Figure 6: The Start Data Transfer button in the Data Migration Tool.

Use this button to start the data migration process to the EDM database.

Main Menubar Commands

Action > Start Data Transfer

Use this command to start the data migration process to the EDM database.

Action > Load Picklist Metadata

This command is used for DIMS data migration only. Use it to read the database structure for a7_sys.MDB (System data source) and load it into metadata (DT_SOURCE_FIELD) for staging purposes.

Action > Load System Metadata

This command is used for DIMS data migration only. Use it to read the database structure for a7_pick.MDB and load it in metadata (DT_)SOURCE_FIELD) for migration purposes.

Action > Exit

Use this command to exit the Data Migration Tool.

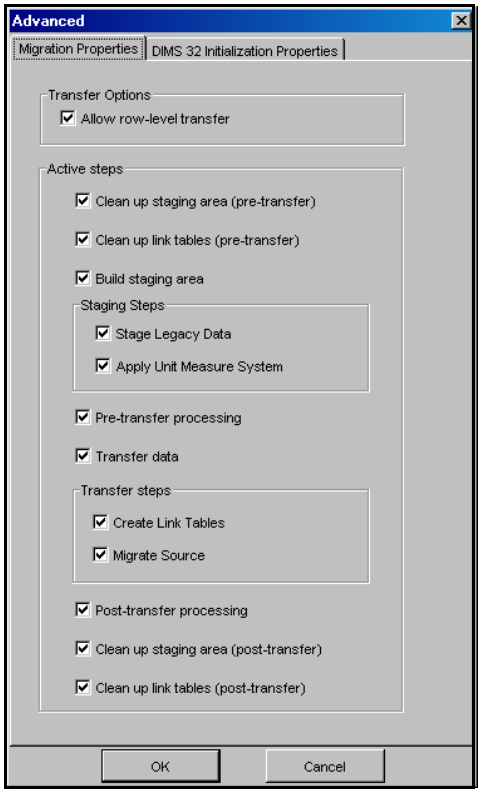
Options > Advanced...

The Advanced dialog contains the following tabs:

- Migration Properties Tab
- DIMS 32 Initialization Properties Tab

Migration Properties Tab

Use the Migration Properties tab to select any of the following options to customize the data migration process. By default all options are activated.



Transfer Options

This area allows for the selection of options to modify or customize the data migration process.

- **Allow row-level transfer**

  If the initial migration of a table in its entirety fails, activating this checkbox will force the movement of data within the table one row at a time moving all rows that can be moved successfully.

Active steps

- **Clean up staging area (pre-transfer)**

  When this step is activated, the Data Migration Tool removes any data migration staging tables (e.g., EDM_SA.XXX) created during a previous migration process. If DIMS data is being migrated, this steps clears out picklist tables from the location designated in **Picklist Home**. The staging area is normally cleared out at the end of the previous migration process.

- **Clean up link tables (pre-transfer)**

  When activated, the Data Migration Tool removes any linking tables (e.g., L_XXXX.XXX) created during a previous migration from the target EDM database. These tables are normally cleared out at the end of the previous migration process.

- **Build staging area**

  Create EDM_SA tables (staging area tables), move data from Source database to a temporary migration staging area.

- **Staging Steps**

  Staging happens in two steps: the source data is staged in tables owned by EDM.SA and then the unit measure system is applied.

  When the **Stage Legacy Data** checkbox is activated, a carbon copy of the source data in the EDM database is made. In this copy, all data belongs to the edm_sa user. As a result of this

step, the original database is never modified. The tables are built from the metadata definitions in DT_SOURCE_FIELD.

The **Apply Unit Measure System** step converts from legacy database units to EDM database units. Deactivate the **Apply Unit Measure System** checkbox to break the data migration process into even smaller steps. The user may choose to process the legacy data up to the **Stage Legacy Data** step and then complete the migration by selecting the **Apply Unit Measure System** checkbox and all the checkboxes below it in the process.

- **Pre-transfer processing**

  If Pre-Migration SQL or JQL scripts are configured in the Field Mapping Tool through the **Options > Scripts...** menu path; they are run during the Pre-transfer processing step. These scripts allow for the modification of legacy data in the staging area prior to being moved to EDM data tables.

> **Note:**
>
> The shipped configuration for the EDM software includes pre-transfer SQL and JQL script.

- **Transfer data**

  When activated, the data located in the staging area is migrated to its new location in the EDM database.

- **Transfer steps**

  The actual migration of the legacy data occurs in two steps: **1)** the link tables are created to hold the data (**Create Link Tables**) and **2)** then the insertion of data into those tables begins (**Migrate Source**).

- **Post-transfer processing**

  If Post-Migration SQL or JQL scripts are configured in the Field Mapping Tool through the **Options > Scripts...** menu; they are run during the Post-migration processing step. These scripts allow for the modification of EDM data after it has been migrated from the legacy database.

- **Clean up staging area (post-transfer)**

  When activated, the Data Migration Tool removes any staging tables created during the migration process. This speeds up the next data migration. Deactivate this option to use staging tables for debugging the data migration.

- **Clean up link tables (post-transfer)**

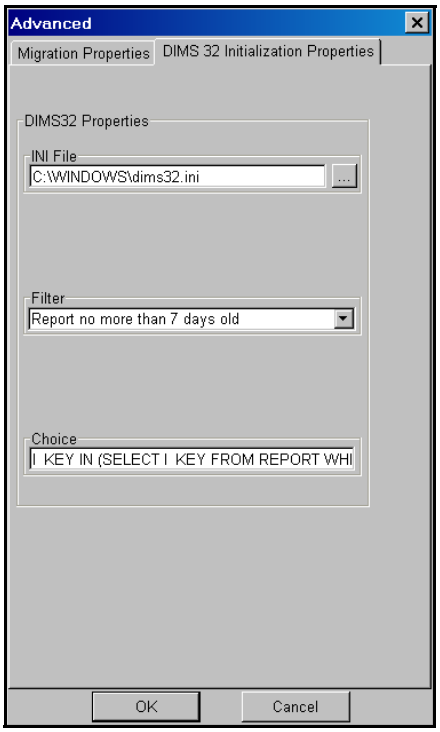
  When activated, the Data Migration Tool removes any linking tables created during the migration process. This speeds up the next data migration. Deactivate this option to use link tables for debugging the data migration.

> **Note:**
>
> All of the above advanced options default to active. When debugging a failed data migration it may be useful to deactivate one or more of the options or run the data migration in two stages by running up to and including the **Stage Legacy Data** option and starting the next step of the migration with the **Apply Unit Measure System** option and continuing to the end of the process.

DIMS 32 Initialization Properties Tab

Use the DIMS 32 Initialization Properties tab to migrate Wells one at a time.

> **Note:**
>
> The DIMS32 Initialization Properties tab is only available when DIMS software has been selected for migration.



To migrate a Well:

1. Enter the location of DIMS32.INI file in the INI File field, or use the ... button to navigate to the location of the file.
2. Select *WellList Configurations* from the **Groups** picklist.
3. Select the Well to be migrated from the **Properties** picklist.
4. Select the Where clause from the **Property Value(s)** picklist.
5. The Where clause is copied to the Choice field where it can be edited if desired.

The Data Migration must be repeated for each Well migrated.

Start Data Transfer

Select the **Start Data Transfer** button in the Data Migration Tool main window to begin the Data Migration process.

The data migration process occurs in seventeen steps;

1. **Open Connection to Databases**

   The Data Migration Tool connects to the Source databases and the EDM database.

2. **Check Database Configuration**

   A test is run to ensure that EDM_SA work tables can be created and an EDM owner/user assigned. A test table is created; a row is inserted, updated and deleted; then the table is dropped.

3. **Log Data Model Version**

   The Data Migration Tool checks the version of the EDM data model and notes the version number in the log file.

4. **Check for Matching Sessions**

   The tool checks for previous occurrences of data migrations with similar parameters. If a source database of the same name, for the same application, with the same target database was previously run successfully; the Transfer Status dialog box appears with the following message: *"This data transfer was previously run. Would you like to run it again?"* The user must select **Yes** or **No** as appropriate.

5. **Check Application ID**

   This step in the migration of data confirms that the application entered (if a user is entering the IDs in a command line) matches other selections made.

6. **Check Mapping Set ID**

   This step in the migration confirms that the mapping set IDs entered (if a user is entering the IDs in a command line) match the mappings available.

7. **Check Unit Conversion Configuration**

   The tool runs two tests with unit samples to confirm that the unit conversion configuration is working correctly.

8. **Begin Migration Session**

   This step in the progress status dialog box provides a marker to indicate that the actual process of migrating the data to the EDM database has begun.

9. **Clean Up Temporary Data**

   Data Migration removes the staging and linking tables from previous data migrations that were not previously removed.

10. **Build Staging Area**

    Data Migration moves the legacy data from the Source database to a staging area in the EDM system. The staging area is a schema, created in the EDM database, where the legacy data is copied and modified by the pre-migration process. System information and picklists are staged as well providing an initial source for their migration. Once these changes have been made the data is relocated to a new permanent area in the EDM database. The building of the staging area occurs in two steps. First the staging area is built and then the unit measure system is applied to the staging area schema.

11. **Run Pre-Transfer Script(s)**

    If Pre-Migration SQL or JQL scripts were configured in the Field Mapping Tool through the **Options** > **Scripts...** menu; they are run during the pre-migration processing step. These scripts allow for the modification of Source data once it has been moved to the staging area in the EDM system.

12. **Transfer Data**

    The staging area data is moved to its new location in the EDM database. The link tables are created and the source data is migrated.

13. **Run Post-Transfer Script(s)**

    If Post-Migration SQL scripts were added in the Field Mapping Tool through the **Options** > **Scripts...** menu; they are run during the post-transfer processing step. These scripts allow for the modification of EDM data after it has been migrated from the legacy databases.

During the post-migration some field descriptions are updated using codes from picklists. These picklists must either be present in your picklist schema; or you should update postmigration.ora/ sql queries numbered 66, 83, and 84 to point to your own equivalent picklist in order for these updates to work.

The picklist schema is assumed to be PK. If your picklist schema is not using PK, you should modify those queries substituting your schema owner. The picklists expected are PK_SHOWS, PK_LOGTYPE and PK_GROSLITH"

14. Clean Up Temporary Data

Removes any temporary staging tables and link tables.

15. **End Migration Session**

This step in the progress status dialog box acts as a marker to indicate that the process of migrating the data to the EDM database is complete.

16. **Close Connection to Databases**

Data Migration disconnects from the Source database and the EDM database.

The migration process is complete. The Data Merging Tool may be used to merge data previously stored in separate databases as multiple migrations from the same legacy database type may be performed. Additional data migrations may be performed from other legacy databases until all legacy data sets are migrated to the EDM database.

Procedure—Data Migration

This section details the procedure for migrating legacy data from the Source database to the EDM database.

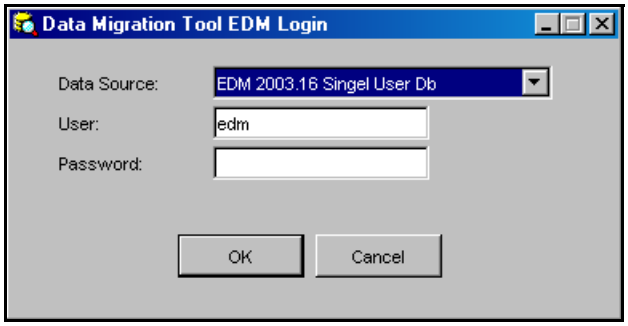
1. Obtain the current Drilling Application (Source) database. Implementation teams should coordinate and collate all available legacy data into one data set prior to the Data Migration process to reduce the number of data migration instances required for their implementation.

> **Important!**
>
> The EDM and Source databases should be backed up prior to a data migration.

2. To start the Data Migration Tool, follow the menu path:

   Start > **Programs** > **Landmark Engineer's Desktop 5000.1** > **Tools** > **Drilling Data Migration**

   The *Data Migration Tool EDM Login* dialog box appears.

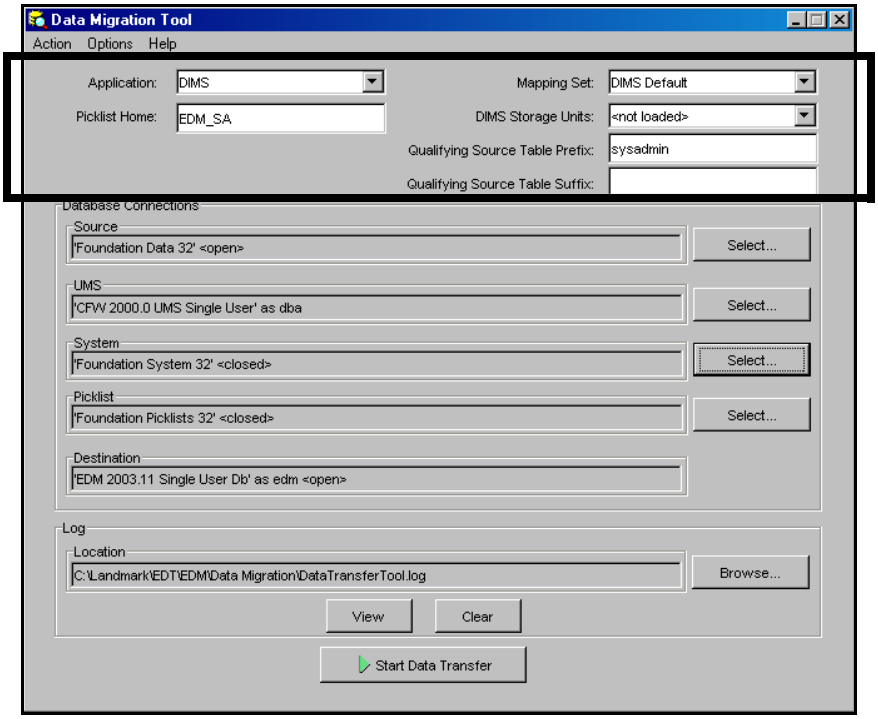


3. Using the dropdown picklist, select the **Data Source** (name of the configured EDM database). The default name for a SQL Server 2005 Express database is 'EDM 5000.1 Single User Db'. This is the EDM database that is created during the EDM Common installation for Drilling applications.

4. Enter the user name and password in the fields provided. The default SQL Server 2005 Express database username and password are 'edm' and 'Landmark1'.

5. Click **OK**.

The *Data Migration Tool* window appears.



6. Select the Drilling application name from the **Application** field dropdown picklist. Three applications are supported COMPASS, DIMS, and WELLPLAN. This is a required field.

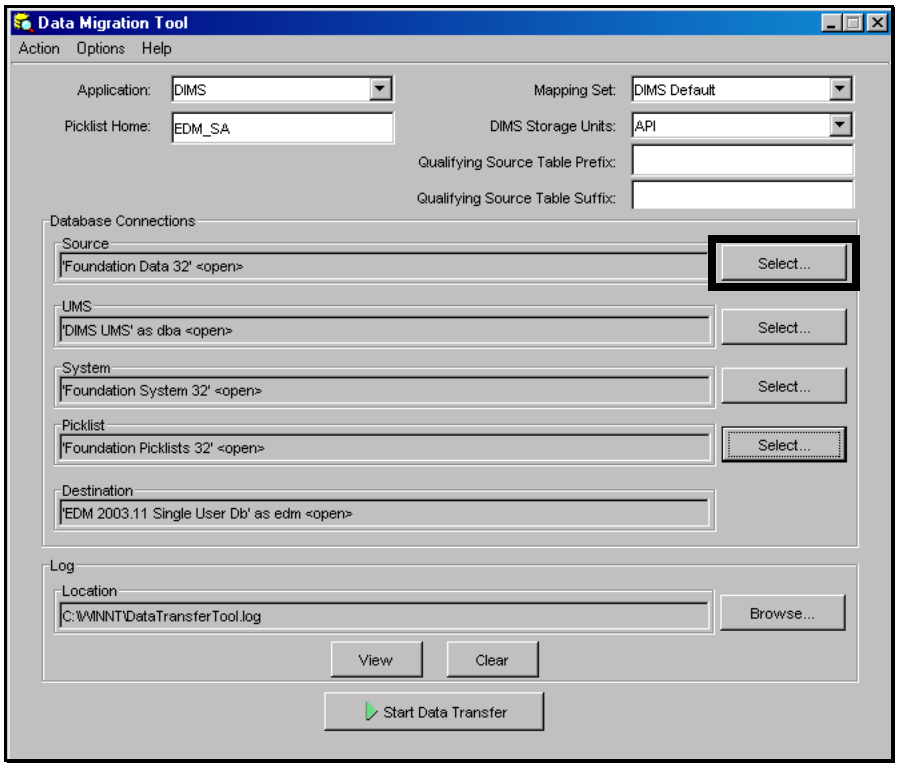
7. From the **Mapping Set** field, select the application default or, if the source database mappings have been customized, select the mapping set created with the Field Mapping Tool. There is a default mapping set for every combination of supported database product and application product.

8. If DIMS data is being migrated, enter a name in the **Picklist Home** field. The **DIMS Storage Unit** field will appear with <*not loaded*> in the field until the **UMS** has been chosen in the Database Connections area. Once the **UMS** is chosen, return to the **DIMS Storage Unit** field to make a selection. The **Picklist Home** and **DIMS Storage Unit** fields are only available when DIMS data is being migrated. The **Picklist Home** field is used to define the schema owner of the client controlled picklists migrated from the DIMS database. It is best to use the default staging area schema, EDM_SA. If a user chooses PK as the schema, the standard picklist tables shipped with EDM are deleted. This happens as the clean up picklist schema migration step occurs. Enter an owner in this field and press **Enter** to set the picklist.

9. If using specialized access to tables enter the appropriate information in the **Qualifying Source Table Prefix** and **Qualifying Source Table Suffix** fields. For COMPASS and DIMS data migrations, it is possible that a prefix for source tables is required. This depends on how the table ownership is configured. If a COMPASS table belonging to 'dba' is present the user would enter **dba.** (note the punctuation at the end of the prefix) in the **Qualifying Source Table Prefix** field. A suffix may also be added for a source table though it is rarely needed.

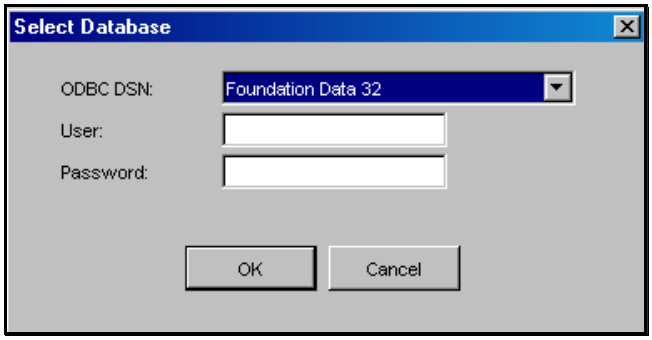
> Data Migration of DIMS Data on Oracle
>
> When logging into the DIMS data source as the table owner, in the prefix field enter either the table owner plus prefix (e.g., dims_owner.DIMS) or the prefix alone (e.g., DIMS_).
>
> When logging into the DIMS data source as a user that *does not* own the DIMS tables, the path must be fully qualified; use the schema owner and the prefix (e.g., dims_owner.DIMS_ or "dims_admin.DIMS_DATA_).

10. In the *Database Connections* area:



11. Click **Select** beside the **Source** field.

The *Select Database* dialog box appears.



12. Use the dropdown picklist to select the **ODBC DSN**. This is the legacy application data set (e.g., DIMS, WELLPLAN, or COMPASS) to be migrated to the EDM database.

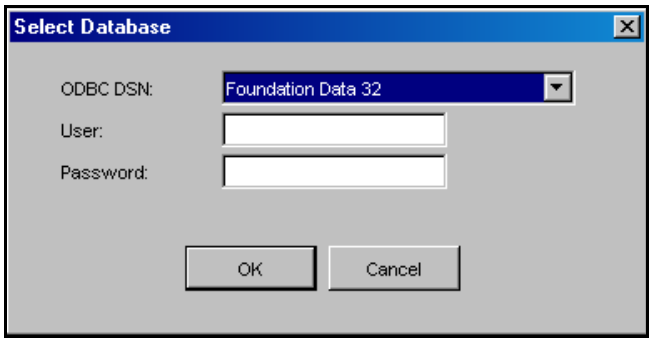
13. Enter the username and password in the fields provided.

> **Note:**
>
> WELLPLAN Microsoft Access databases do not have a user name or password. In these cases leave the fields blank.
>
> If the DIMS legacy data uses Microsoft Access databases no user name or password are required.
>
> COMPASS SQL Anywhere database User is 'DBA' and password is 'SQL'. Clients using COMPASS software on Oracle should request the user name and password from their Oracle Database Administrator.

14. Click **OK**.

15. If migrating a COMPASS or DIMS database, click **Select** beside the **UMS** field.

    The *Select Database* dialog box appears.



16. Using the dropdown picklist, select the **ODBC DSN** (data source name) of the Unit Management System database.

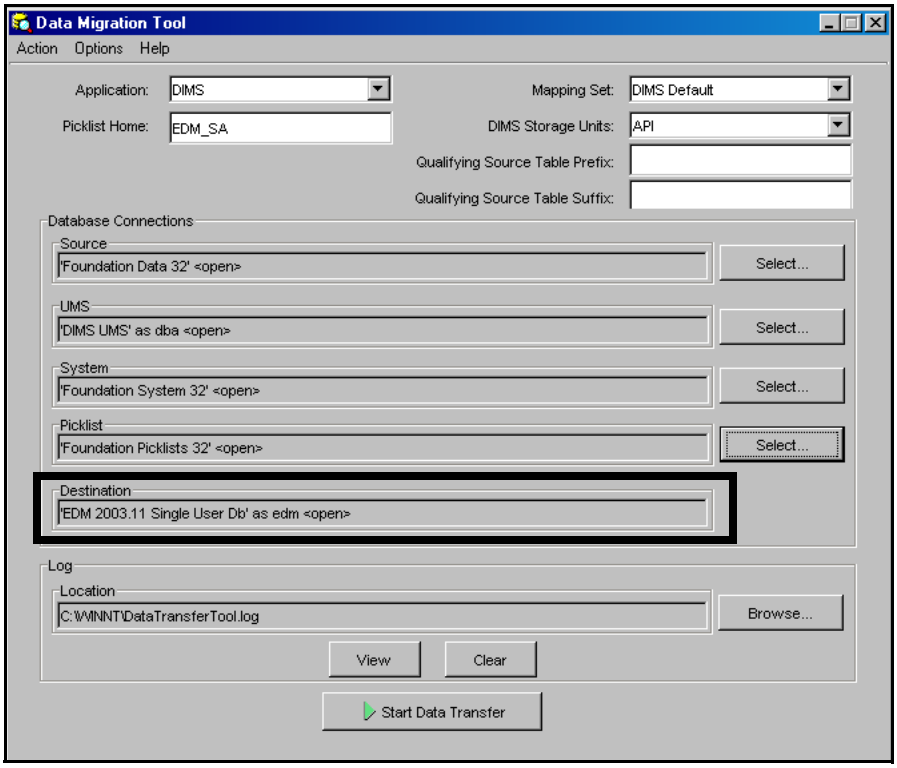
> **Note:**
>
> Previous versions of DIMS did not need a Unit Management System database. This type of database is required to migrate legacy data to the EDM database. As a result, the Engineer's Desktop 5000.1 installation creates a data source for the DIMS software called UMS.MDB. The default location for this database is the EDT_5000.1\EDM\Data Migration\Lib folder.

17. Enter the user name and password in the fields provided. SQL Anywhere user name and password for COMPASS client databases are 'dba' and 'sql' respectively. For a DIMS database, leave the user name and password blank.

18. Click **OK**. If a DIMS database is being migrated, the **DIMS Storage Units** field is automatically populated with a picklist to select the storage units for the migration once the **UMS** has been selected. Select the appropriate **Storage Units** for the legacy database to be migrated.

19. If DIMS data is being migrated the **System** and **Picklist** fields will be available as well. Click **Select** to access the Select Database dialog box.

The **Destination** field will contain the name of the new EDM database. This field is populated when the user logged into the EDM database in step 1.



Note:

The following two steps must be performed when a DIMS legacy database is being migrated. It is not necessary to load picklist or system metadata when migrating COMPASS or WELLPLAN data.

20. If DIMS data is being migrated, load the metadata for the picklist by following the menu path: **Action > Load Picklist Metadata**. Loading the metadata may take several moments and when it is complete the following message will appear: "*Picklist metadata is loaded.*" Click **OK** to return to the Data Migration Tool main window.

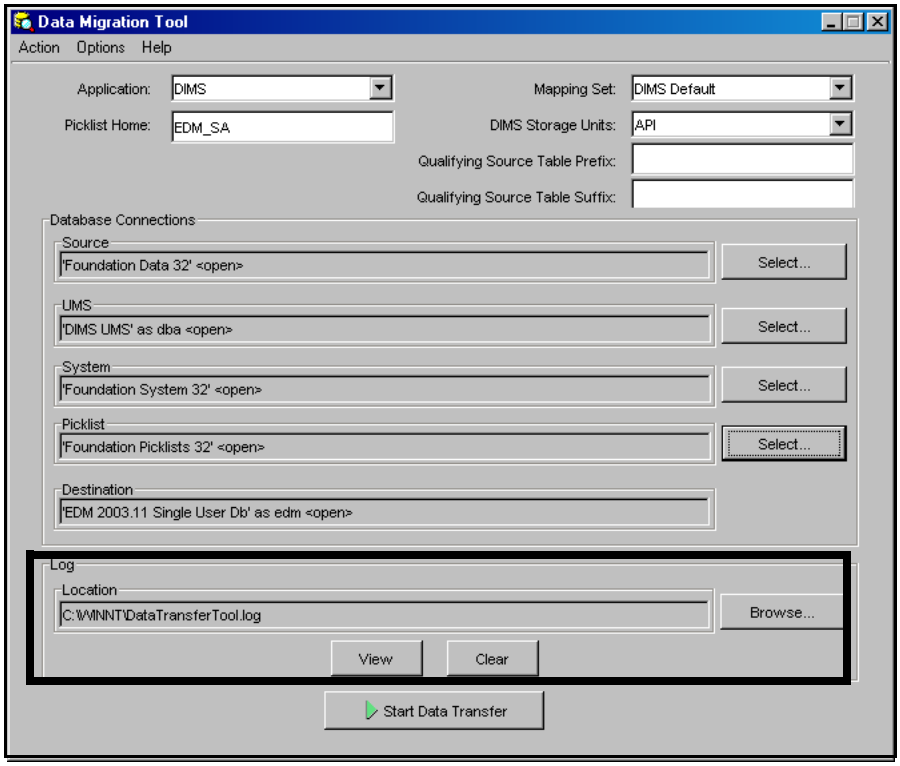
21. If DIMS data is being migrated, load the system metadata by following the menu path: **Action > Load System Metadata**. Loading the metadata may take a few moments. When it is loaded

the following message will appear: "*System metadata is loaded.*" Click **OK** to return to the Data Migration Tool main window.

Important:

If migrating DIMS data ensure you have updated your SYSINFO Parameters as outlined in Step 21 of the DIMS™ Data Pre-Transfer Preparation - QA chapter.

In the *Log* area:



22. Click **Browse** to navigate to the location where the log file is to be saved. The Log File window appears. Enter the name of the log file in the **File name** field and click **Select**.

Note:

For a DIMS data migration, it is recommended that the Data Transfer process be split into four steps using the **Options > Advanced** menu item. The Landmark recommended sequence is as follows:

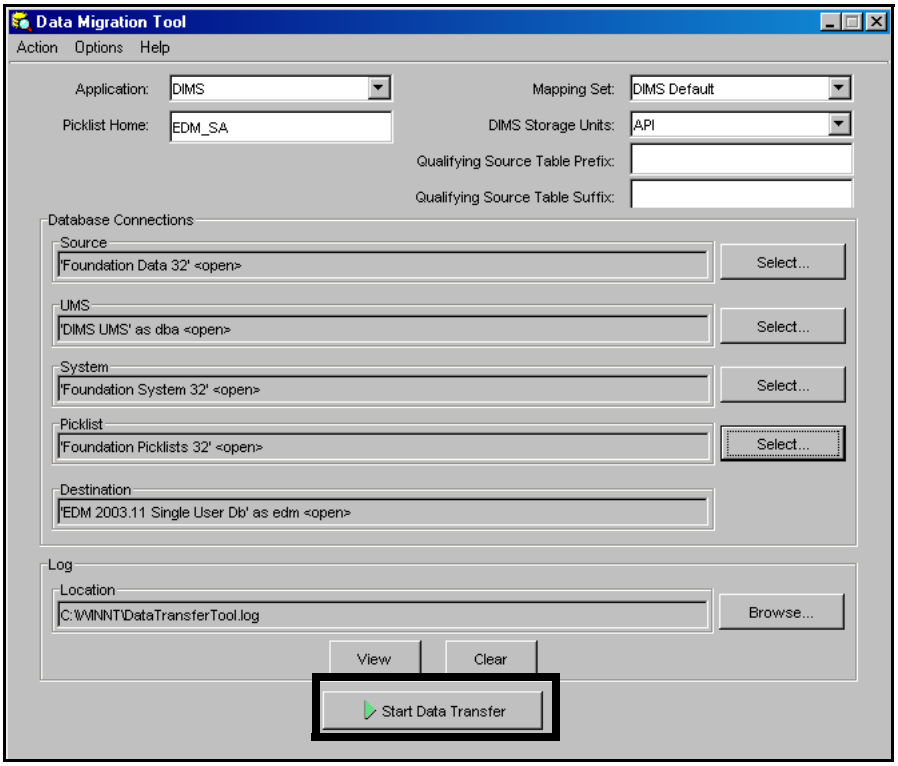
1) Activate the following checkboxes in the Advanced window: Allow row-level transfer, Clean up staging area, Clean up link tables, Build staging area, Stage Legacy Data, and Apply Unit Measure System; click **Start Data Transfer**; once complete verify success using the **View** button in the Log area; return to the Advanced window using the **Options > Advanced** menu item;

2) Deactivate all previous checkboxes and activate the Pre-transfer processing checkbox; click **Start Data Transfer**; once complete verify success using the **View** button in the Log area; return to the Advanced window using the **Options > Advanced** menu item;

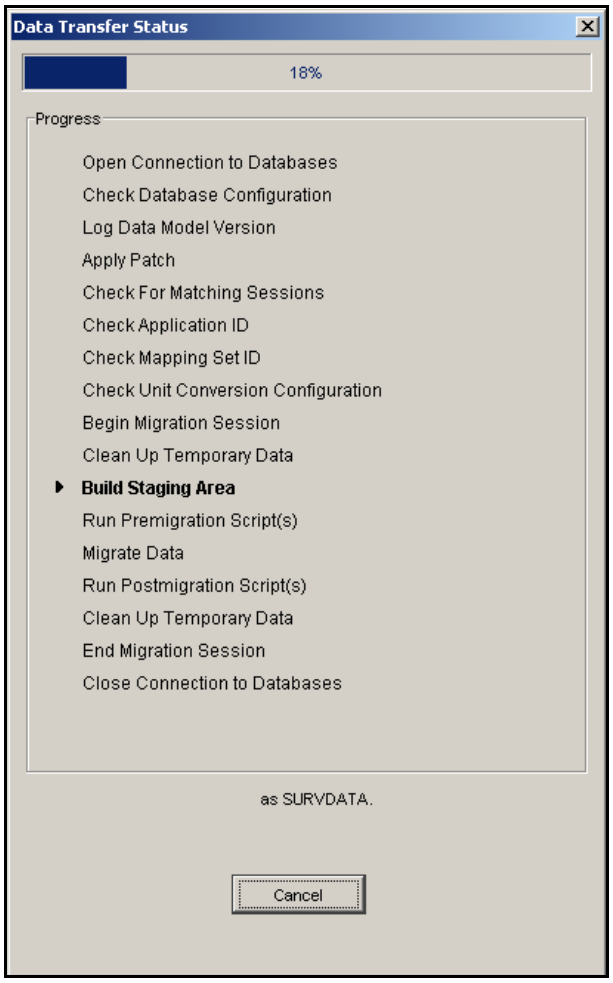
3) Deactivate all previous checkboxes and activate the following checkboxes: Transfer data, Create Link Tables, Migrate Source; click **Start Data Transfer**; once complete verify success using the **View** button in the Log area; return to the Advanced window using the **Options > Advanced** menu item;

4) Deactivate all previous checkboxes and activate the following checkboxes: Post-transfer processing, Clean up staging area, Clean up link tables; click **Start Data Transfer**; once complete verify success using the **View** button in the Log area.

23. Click **Start Data Transfer** to begin the data migration process.



The *Data Transfer Status* window appears.



This status window displays the progress of the data migration and which of the seventeen steps the migration is currently on.

Note:

If a source database of the same name has already been migrated, the Transfer Status dialog box appears with the message:

"This data transfer was previously run. Would you like to run it again?"

To proceed, click **Yes**. In the case of an automatic migration the -force argument is initiated here. (See "-force" on page 77.)

To cancel the migration, click **No**.

24. To view the current log file, click **View**. The contents of the log file is displayed within Windows Notepad.

25. To clear the current log file, click **Clear**. This is a useful feature when a new data migration is about to be performed.

    Take a backup copy of the Data Migration Log file and store it for future migration support or quality assurance issues.

> **Note:**
>
> Due to changes in the way COMPASS software calculates survey error ellipse values, COMPASS 2000.0 definitive survey data is not migrated. The following step completes the migration of the COMPASS survey data.

26. Open the EDM database that COMPASS data was migrated to using the COMPASS 5000.1 application.

    When the COMPASS 5000.1 software connects to the database it checks for the newly migrated data. All definitive paths belonging to the newly migrated company(s) are rebuilt using the survey program. In the process, survey errors are recomputed using the ISCWSA error model.

Procedure—Transfer of Data for Multiple Databases

Follow the steps outlined in “Procedure—Data Migration” on page 94 for each source database. Once this has been completed, all data sets will be located separately in the EDM database. The migration of data is now complete. The next step is to merge any duplicate data for each of the databases (see “EDM™ Data Merging” on page 115).

Migration of DIMS Custom Configuration

The Data Migration Tool has been configured to migrate all applicable custom setups from a DIMS database when equivalent functionality exists in the EDM Administration Utility. A number of post migration scripts are included in the tool to accomplish the migration of custom configuration.

Users/Security

The post migration scripts will migrate usernames and passwords as well as each users' security level. It also migrates groups and associates users with their group. The script that runs in the post migration will not migrate any Rights. Tokens are not migrated either and must be recreated in the EDM Administration Utility.

> **Note:**
>
> Tight groups are migrated in the pre-migration steps.

Picklists and Picklist Configuration

The post migration scripts will migrate the following information concerning picklists and picklist configuration from the DIMS legacy database to the EDM database:

- Multi-Column Updates
- Display Columns
- Edit Control
- Sort

Custom Field Security

This post migration script will migrate the customized level of security from the DIMS legacy database for any field that is *not* at the default security level of **5**. This information is migrated to the MD_SITE_ATTR_DICTIONARY table.

Optional Labels

All optional labels entered in client customizations will be migrated from the DIMS legacy database to the EDM database. This information is migrated to the MD_SITE_ATTR_DICTIONARY table.

Extra Notes

Any extra notes entered in the DIMS legacy database will be migrated to the EDM database using a post migration script. This information is migrated to the MD_SITE_ATTR_DICTIONARY table.

Carryover

The configuration that allows a field to be carried over from one report to another will be migrated from the DIMS legacy database to the EDM database. This information is migrated to the MD_SITE_ATTR_DICTIONARY table.

Known DIMS™ to EDM™ Unit Conversion Issues

The following table outlines Unit Conversion warnings that may appear during the Migration Process.

DIMS Field	Unit	Unit Store	EDM Field	Unit	Unit Store	Comment
TESTSWAB.salinity	57	ppg	CD_TEST_SWAB.FLUID_SALINITY	39	ppm	DIMS unit was incorrect. It does not appear that salinity can be measured in ppg - see http://www.iep.water.ca.gov/suisun/facts/salin/salinityConversion.jpg. If a client was storing in something other than ppm, a manual conversion of this data may be needed. You should also look at DIMS units assigned to this field.
TESTSWAB.oil_rate	285	bbl	CD_TEST_SWAB.OIL_RATE	66	bbl/d	Note the warning only. No issue since the test represented a day in DIMS and these measures are equivalent.
TESTPUMP.daily_prod	285	bbl	CD_TEST_BEAM.DAILY_PRODUCTION	66	bbl/d	Note the warning only. No issue since the test represented a day in DIMS and these measures are equivalent.
TESTFLOW.salinity	57	ppg	CD_TEST_FLOW.SALINITY	39	ppm	DIMS unit was incorrect. It does not appear that salinity can be measured in ppg - see: http://www.iep.water.ca.gov/suisun/facts/salin/salinityConversion.jpg. If a client was storing in something other than ppm, a manual conversion of this data may be needed. You should also look at DIMS units assigned to this field.
TESTFLOW.h2s	154	%	CD_TEST_FLOW.H2S_CONC	39	ppm	Unit changed in EDM database. If necessary the conversion is based on unit type selected in DIMS software in premigration query.
STIMSTG.in_fracgrd	185	psi	DM_STIM_STAGE.FRACTURE_GRADIENT_INITIAL	167	psi/ft	This unit has been changed to store a fracture gradient, not a measure of pressure.

DIMS Field	Unit	Unit Store	EDM Field	Unit	Unit Store	Comment
MUDCHECK.cacl	154	%	CD_FLUID.CONC_CACL	239	%	Note the warning only. No issue since both are percent values.
GEN_GVPK.shear	132	Mlbs	DM_GRAVEL_PACK.SHEAR_JOINT_RATING	98	kip	Note the warning only. No issue since1 Mlb = 1 kip.
GEN_DST.salinity	57	ppg	DM_DST.SALINITY	39	ppm	DIMS unit was incorrect. It does not appear that salinity can be measured in ppg - see http://www.iep.water.ca.gov/suisun/facts/salin/salinityConversion.jpg. If a client was storing in something other than ppm, a manual conversion of this data may need done. DIMS units assigned to this field should be looked at
DECKLOG.trim	122	ft	DM_RIG_DECKLOG.TRIM_ANGLE	16	deg	DIMS unit was incorrect. EDM database assumes that this data would have been entered in degrees, since feet does not make any sense. Recommend that DIMS data is reviewed. Warning will occur if default DIMS unit was not changed, and data will be moved as it was found in the DIMS database.
DECKLOG.heel	122	ft	DM_RIG_DECKLOG.HEEL_ANGLE	16	deg	DIMS unit was incorrect. EDM database assumes that this data would have been entered in degrees, since feet does not make any sense. Recommend that DIMS data is reviewed. Warning will occur if default DIMS unit was not changed, and data will be moved as it was found in the DIMS database.
DECKLOG.displace	284	ft3	DM_RIG_DECKLOG.VESSEL_DISPLACEMENT	130	ton	EDM database uses conventional unit for vessel tonnage.
CMTSLUR.fluid_loss	292	cc	CD_CEMENT_SLURRY_TEST.FLUID_LOSS	455	cc/30min	No issue, API Fluid Loss is 30 minutes.

DIMS Field	Unit	Unit Store	EDM Field	Unit	Unit Store	Comment
CENT_OPS.cent_oil	455	ml	DM_CENTRIFUGE_OP.VOL_OIL_RETAINED	283	ml	No issue, equivalent unit. Problem is due to DIMS 'Fluid Loss' unit class being used.
BITOPS.hydra_hp	164	hhp/in2	DM_BIT_OP.HYDRAULIC_HP	330	hhp	A client could use this field in one of two ways in the DIMS database. Based on the SYSINFO setting, we are converting if necessary in premigration query.
PLANMUD.frac_grad	53	lb/ft	CD_FRAC_GRADIENT.FRAC_GRADIENT_EMW	57	ppg	DIMS unit was incorrect. EDM database assumes the data was entered as ppg in the DIMS database. Valid value ranges would be 11 - 21.
PLANMUD.overb_grad	53	lb/ft	CD_FRAC_GRADIENT.OVERBURDEN_GRADIENT	57	ppg	DIMS unit was incorrect. EDM database assumes the data was entered as ppg in the DIMS database. Valid value ranges would be 11 - 21.
PLANMUD.pore_pres	57	ppg	CD_PORE_PRESSURE.PORE_PRESSURE	185	psi	Unit changed in EDM. If necessary the conversion is based on unit type selected in DIMS software in premigration query.
PLANMUD.porep_grad	53	lb/ft	CD_PORE_PRESSURE.PORE_PRESSURE_EMW	57	ppg	DIMS unit was incorrect. EDM database assumes the data was entered as ppg in DIMS software. Valid value ranges would be 8.34-20 for over balanced muds. May be less for under-balanced muds.
TESTSWAB.gas_volume	127	in	CD_TEST_SWAB.GAS_VOLUME	327	Mscf	DIMS unit was incorrect. EDM database assumes the data was entered appropriately, as the unit shown in DIMS database does not make sense. It is recommend that Clients check the unit their data was captured in and if necessary change FDD_DICT to reflect the data entered.
TESTSWAB.pres_dynam	128	gal	CD_TEST_SWAB.DYNAMIC_PRESSURE	185	psi	DIMS unit was incorrect. EDM database assumes the data was entered appropriately, as the unit shown in DIMS database does not make sense. It is recommend that Clients check the unit their data was captured in and if necessary change FDD_DICT to reflect the data entered.

DIMS Field	Unit	Unit Store	EDM Field	Unit	Unit Store	Comment
ESTSWAB.pres_stat	128	gal	CD_TEST_SWAB.STATIC_PRESSURE	185	psi	DIMS unit was incorrect. EDM database assumes the data was entered appropriately, as the unit shown in DIMS database does not make sense. It is recommend that Clients check the unit their data was captured in and if necessary change FDD_DICT to reflect the data entered.

Troubleshooting

Data Migration Troubleshooting

Potential Overflow Scenario

Values in the COMPASS wellbore declination column, STRACK.declin must be greater than -2 and less than 2, and values for the wellbore magnetic dip column STRACK.magdip must be greater than -4 and less than 4.

During testing of the Data Migration Tool some large numbers were detected which will result in a “potential overflow scenario” warning appearing in the log file for every row with a value out of the STRACK.declin, -2 to 2 and the TRACK.magdip -4 to 4 ranges.

This warning can be ignored as the “out of range” values are set to 0 prior to the data being migrated to the EDM database.

Isolated Migration of Specific Tables

Specific tables in databases may pose a problem during the migration of data resulting in a need to migrate these tables separately. Isolating a single table or sequence of tables allows for easier debugging should the migration be unsuccessful.

In these instances, the properties for the migrate source configuration file (DataTransferTool.properties) can be changed to isolate a single table or sequence of tables for migration apart from the rest of the legacy data set. In essence a sub list of tables can be defined for migration.

1. In order to isolate a specific table or a sequence of database tables to be migrated, use a SQL Editor or the EDM database to determine the sequence number of the table(s). These sequence numbers are used to order the tables as they migrate.

   For example, to isolate the Definitive Survey Header table in COMPASS (CD_DEFINITIVE_SURVEY_HEADER), use the following query to obtain the table’s sequence number:

   ```
   SELECT table_name, sequence_num, count(*)
   FROM DT_TARGET_FIELD
   ```

```
WHERE sequence_num
= n + (select distinct sequence_num
from DT_TARGET_FIELD
where table_name = 'CD_DEFINITIVE_SURVEY_HEADER')
GROUP BY table_name, sequence_num


Where n = 1, 2, 3, 4, or any number up to and
including the largest sequence number for the
entire series of tables in the database.

n = the number of tables to migrate after the
selected table. The returned table name is the last
table to be migrated in the sequence. If a single
table is to be migrated set n + 1 to find the name
of the table that is migrated immediately after the
target table.
```

2. Access the **DataTransferTool.properties file** to add rows defining the first and last tables to be migrated. The default location for this data migration properties file (based on the Common EDM Installation file that is shipped) is C:\Landmark\EDT_5000.1\EDM\Data Migration. The Data Migration Toolkit ships with a file called **DataTransferTool.properties**. Locate the file and open it using Microsoft Notepad.

   To configure which specific tables are migrated, add the two table names to the **DataTransferTools.properties** file. To add the information to the properties file insert two rows:

   ```
   first.table=[Table Name]
   last.table=[Table Name]
   ```

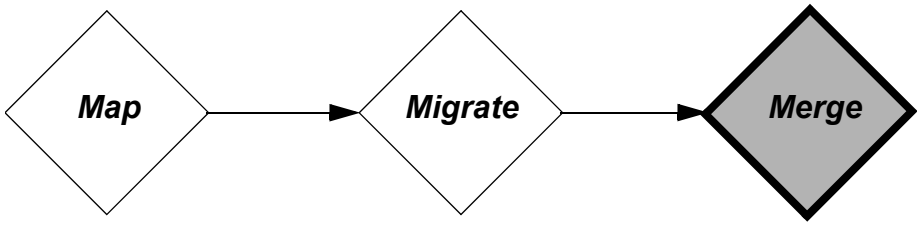
   For example:

   ```
   first.table=CD_DEFINITIVE_SURVEY_HEADER
   last.table=CD_ASSEMBLY_COMP
   ```

   Now the Data Migration Tool can be run to migrate the singular table or series of tables. The series will include the first.table and any tables following the first table up to, but not including, the last.table.

EDM™ Data Merging

Overview



This section provides a detailed description of the purpose of the EDM Data Merging tool, as well as the process for using the tool. Data may be merged at the Company, Project, Site, Well, Wellbore, and Design levels.

EDM Data Merging is used to resolve duplicate data created by the Data Migration process (e.g., business objects for the same well/ wellbore/site are duplicated). This step becomes increasingly important if more than one source database is migrated using the Drilling Data Migration tool (e.g., migrating data from the DIMS™, COMPASS™, and WELLPLAN™ applications or multiple DIMS, COMPASS, and/ or multiple WELLPLAN databases).

Warning:

When merging data, there is no way to undo an accidental merge. If data has been merged accidentally there are two ways to repair the data. The first solution is to perform the data migration again. The second solution is to patch the data in the application (e.g., move a well), which may be the easier option.

Note:

Data Merging does not delete any business objects, it simply copies child business objects to other parent business objects. The duplicate business object is renamed to indicate that it has been merged with a source business object. The duplicate business object may be deleted later by right clicking on the object and selecting **Delete** from the popup menu.

Purpose

The purpose of the EDM Data Merging tool is to combine the migrated legacy data sets into a single integrated EDM data hierarchy.

Data Merging is the last step in the migration of data from a legacy DIMS/COMPASS/WELLPLAN database to the EDM database.

Prior to the migration of data to the EDM database, DIMS, COMPASS, WELLPLAN, and Tubular applications (CasingSeat™ and StressCheck™) stored data in separate locations. Figure 1 shows Data from the DIMS, COMPASS, and WELLPLAN applications after the migration of data has taken place. The migration of data from DIMS, COMPASS, and WELLPLAN applications to the EDM database places all of the migrated data in the same location.

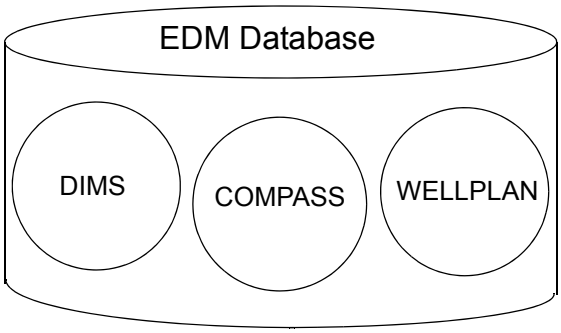


Figure 1: Data from the DIMS, COMPASS, and WELLPLAN applications after the EDM Data Migration tool is used.

Migrating Tubular Data

Business objects in the EDM database that were not transferred by the Drilling Data Migration tool may also be merged (e.g., imported data from CasingSeat and StressCheck flat files).

Tubular data may be imported from legacy flat files on the hard drive to the EDM database through the file menu of these applications.

> **Note:**
>
> CasingSeat and StressCheck data, in .PDI and .SCK files, is imported into the EDM database by the applications—not by the Drilling Data Migration tool.

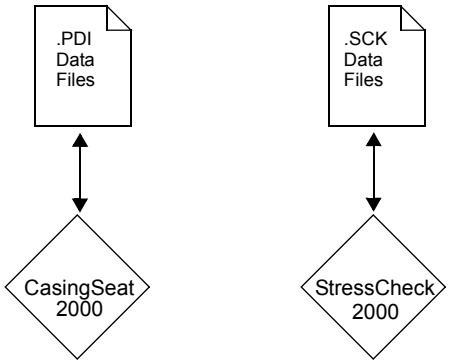


Figure 2: Data accessed by the Release W2000 versions of the CasingSeat and StressCheck applications

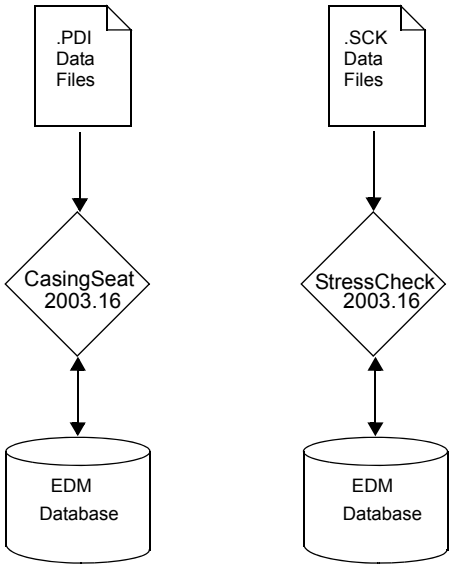


Figure 3: Release 2003 and 5000 versions of the CasingSeat and StressCheck applications may import W2000 data sets into the EDM database.

The EDM Data Merging tool allows the database administrator or client implementation team to merge common business objects between data sets that have been migrated. This enables the removal of duplicate data. The end result is a single data set for all applications, with fewer management requirements, and increased integration capabilities.

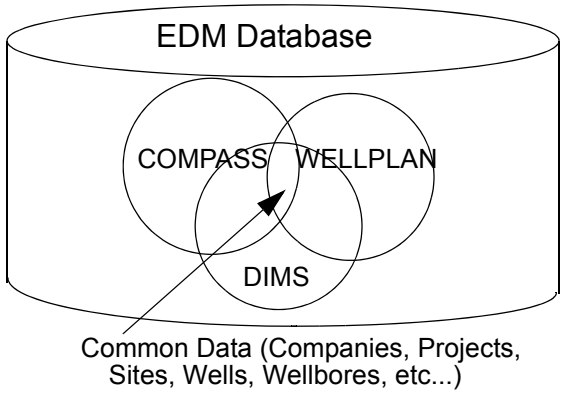
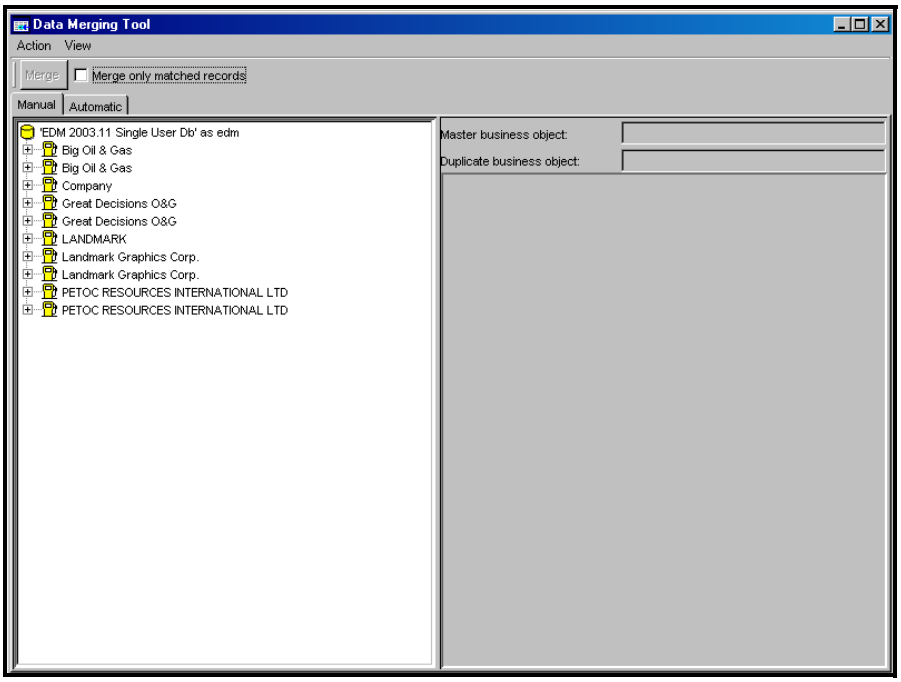


Figure 4: Data from the DIMS, COMPASS, and WELLPLAN applications after using the EDM Data Merging tool.

Using the Tool

The Data Merging Tool Window



This window contains two tabs, which allow the user to merge data using different methods:

- Manual
- Automatic

WARNING!

Automatic merging does NOT support the merging of Wells containing OpenWells® Reports. To merge Wells containing OpenWells Reports, use the Manual merge method.

Merging anything below the Well level does NOT copy over the reports (i.e., merging two Wellbores does not copy the associated reports). Merging Wells or anything higher (Company, Project, Site) supports Report copying. A future release of the Data Merging tool will support movement of OpenWells Reports during the merging process.

Manual Tab

The Manual tab contains a Well Explorer, which allows a user to select equivalent objects and merge them into one data set. A data viewer, on the right side of the window, allows the user to view the selected object contents and compare them prior to merging. When objects are merged, the duplicate data is copied to the master object. The duplicate object may be deleted after the resultant data has been checked for quality through the use of the Engineer's Desktop™ applications.

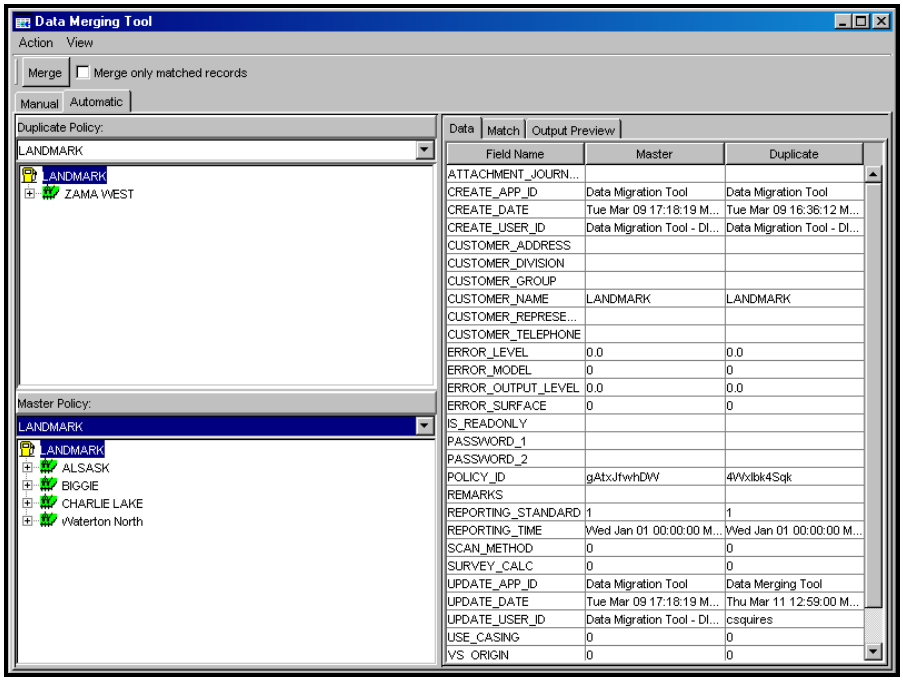
Master Business Object Field

The business object selected to appear in this field acts as the target copy for the **Duplicate business object**. Use the selection tree located on the left side of the Data Merging Tool window, and select the **Master business object**. The object selected appears in the **Master business object** field.

Duplicate Business Object Field

The business object selected to appear in this field is a duplicate of the **Master business object**. Data from the **Duplicate business object** is merged with data contained in the **Master business object**. Using the Well Explorer tree located on the left side of the Data Merging Tool window, hold down the **Ctrl** key and select the duplicate item of the same type using the mouse. The duplicate item then appears in the **Duplicate business object** field. When both Master and Duplicate items have been selected, data may be merged, and the Merge button is activated. The Master and Duplicate object data may be viewed in the adjacent data lists. This allows the user to validate the data pairs to be merged before the merge process.

Automatic Tab



The Automatic tab contains both a Duplicate and Master view of the Well Explorer on the left side of the window, which allows a user to select and match equivalent objects. The right side of the window contains three tabs:

- Data Tab - This tab displays the selected business object's attributes. Theses attributes can be used to match like business objects prior to merging.
- Match Tab - This tab enables the user to define business objects by like attribute(s) and merge their data into one business object.
- Output Preview Tab - This tab displays the results of the data merge prior to the merge taking place.

Merge Button

The Merge button is used to perform the data merging once the EDM Data Merging tool has been configured.

> **Note:**
>
> The EDM Data Merging tool does not delete any business objects, it simply copies child business objects to other parent business objects. Data objects no longer required after data merging is completed must be deleted manually.

Merge only matched records Checkbox

The **Merge only matched records** checkbox is only applicable when using the Automatic tab. When this checkbox is activated only "matched" items will be merged.

Main Menubar Commands

Action > Rename...

Available when the Manual tab is selected, use this command to rename any objects in the Well Explorer. Select the object in the Well Explorer and follow the menu path to access the **Rename** window. Enter the new name and click **OK**.

Action > Delete

Available when the Manual tab is selected, use this command to delete an object in the Well Explorer. If the user chooses to delete an object, a Delete dialog box appears with the following message: *"Are you sure you want to delete 'Object Name'?"*. Click **Yes** to delete the selected item.

Action > Clear All Match Selections

Available when the Automatic tab is selected, use this command to clear any match selections that have been made.

Action > Merge

Use this command to merge two objects in the Well Explorer. Expand the Well Explorer so that both objects can be seen. Select one object, press **Ctrl** while selecting the second object. Follow the menu path to merge the two objects. The **Merge** dialogue box will appear.

The **Merge** button at the top left side of the main window can also be used to merge two objects in the Well Explorer.

Action > Exit

Use this command to exit the EDM Data Merging tool.

View > Refresh

Use this command to collapse the Well Explorer and refresh its contents.

View > Common Well Name

Use this command to change the naming convention from Legal Well Name to Common Well Name. When Common Well Name is selected a check mark will appear beside it.

View > Legal Well Name

Use this command to change the naming convention from Common Well Name to Legal Well Name. When Legal Well Name is selected a check mark will appear beside it.

Help > Using the Data Migration Toolkit

Use this command to launch Adobe Acrobat to make this documentation available in .PDF format.

Help > About

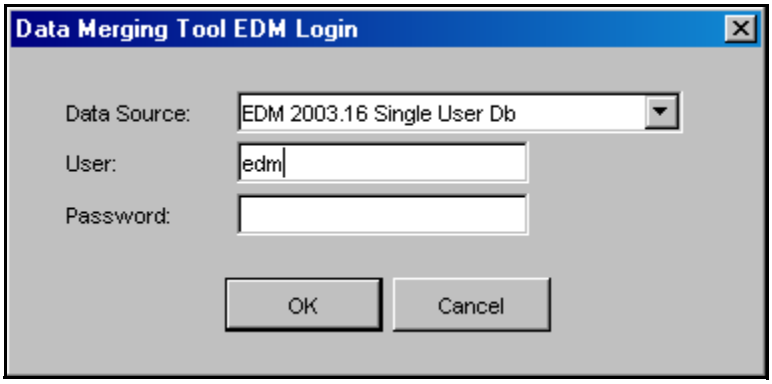
Use this command to view information on the application such as version number and copyright date.

Procedure

1. To access the EDM Data Merging tool window, follow the menu path:

   Start > Programs > Landmark Engineer's Desktop 5000.1 > Tools > EDM Data Merging

   The *Data Merging Tool EDM Login* dialog box appears.



2. Using the dropdown picklist, select the **Data Source** (name of the configured EDM database). The default name for a Microsoft SQL Server Express 2005 database is 'EDM 5000.1 Single User Db'. This is the EDM database that is created during the EDM installation.

3. Enter the username and password in the fields provided. The default Microsoft SQL Server Express 2005 database username and password is '*edm*' and '*landmark*'.

4. Click **OK**.

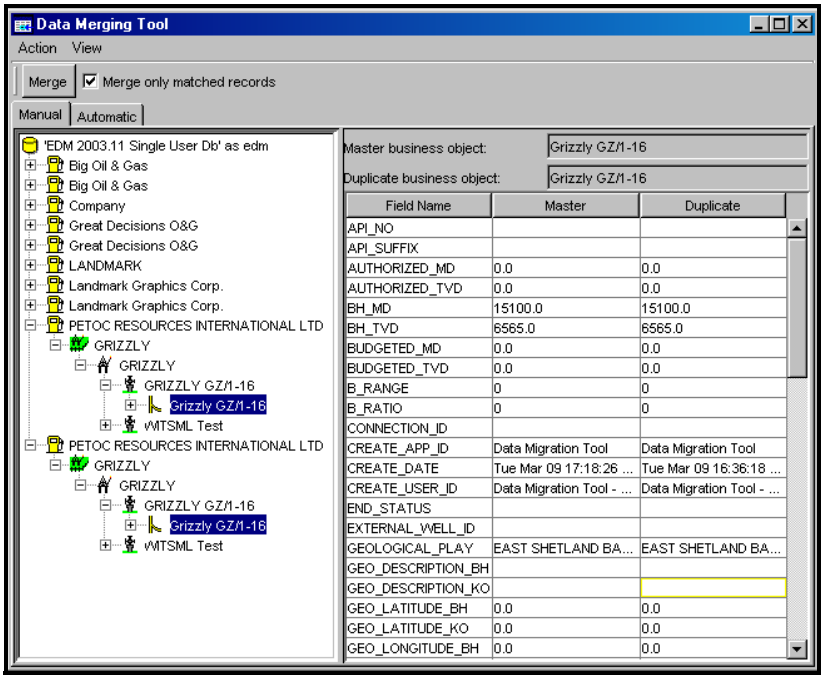
5. The Manual tab appears selected by default. To use the Automatic method of merging, select the Automatic tab.

Using the Manual Tab

For information on using the Automatic method see “Automatic Tab” on page 121.

> **WARNING!**
>
> Merging anything below the Well level does NOT bring over the Reports (i.e., merging two Wellbores does not copy the associated Reports). Merging Wells or anything higher (Company, Project, Site) supports Report copying.

The *Data Merging Tool* window appears.



1. From the EDM Data Merging tool window, expand the EDM database tree.

2. Expand the selection tree in the Well Explorer to locate and select the master business object. The name of the first business object selected appears in the **Master business object** field to the right.

3. Expand the selection tree to locate the duplicate business object. This would be of the same type as the **Master business object**. Hold down **Ctrl** while selecting the duplicate business object. The name of this business object appears in the **Duplicate business object** field.

Once both business objects are selected, the information on the right side of the EDM Data Merging tool window displays the Field Names for the business objects selected, as well as the corresponding data elements and values in both the master and duplicate. Analyze this information to confirm the decision to merge data, as a merge cannot be reversed.

4. Click the **Merge** button to copy the child business objects from the **Duplicate business object** to the **Master business object**.

   The title of the duplicate business object changes to reflect the merge. For example, if the **Master business object** is **LEDUC** and the **Duplicate business object** was originally named **BIGGIE Field,** the name would change to **BIGGIE Field (duplicate of LEDUC)**.

   Repeat steps 2-4 to merge all necessary business objects.

Note:

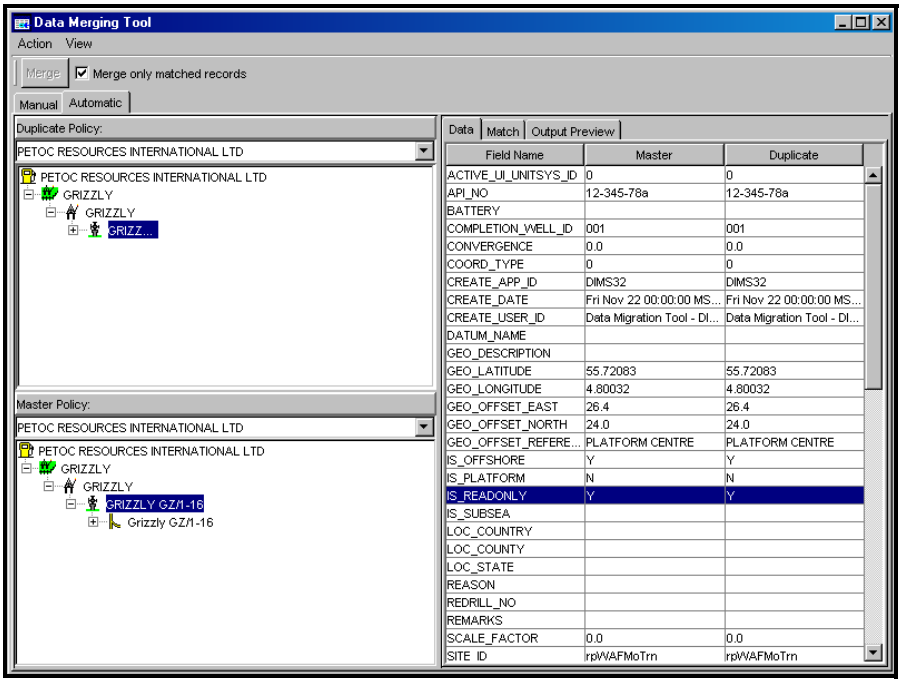
Like Business Objects at any level in the Well Explorer tree can be merged using the EDM Data Merging tool with the exception of the Case, as it is at the bottom of the hierarchy.

Using the Automatic Tab

WARNING!

Automatic merging does NOT support the merging of Wells containing OpenWells Reports. To merge Wells containing OpenWells Reports use the Manual merge method.

The *Data Merging Tool* window appears.



1. Select the Automatic tab.

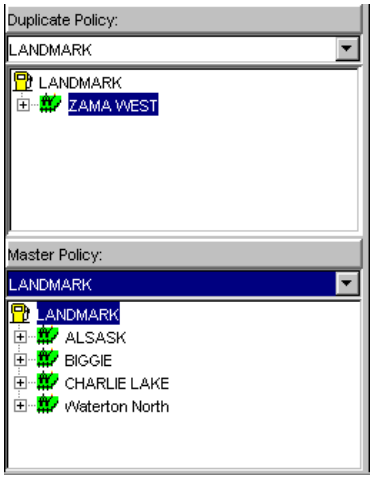
The following scenarios are described:

- “Scenario One - Copying a Project” on page 127
- “Scenario Two - Same Well Different Names” on page 128
- “Scenario Three - Same Well and Wellbore” on page 132

Scenario One - Copying a Project

To merge a Project from a Duplicate Policy (Company) into the Master Policy(Company), which does not currently exist in the Master Policy (Company), use the following procedure.

For example, a Project that is named *Zama West* in the Duplicate Policy (Company) does not exist in the Master Policy (Company).

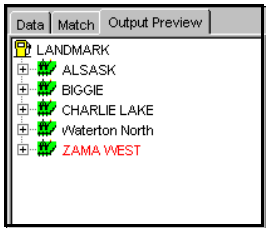


1. From the **Duplicate Policy** dropdown picklist, select the Policy (Company) containing the duplicate object.

2. Navigate to the location of the Project in the Duplicate Policy tree to be added to the Master Policy (e.g., Zama West).

3. From the **Master Policy** dropdown picklist, select the Policy (Company) where the duplicated Project will be copied.

4. Select the **Output Preview** tab to view how the Well Explorer tree will appear once the merge has be completed. Changes made in the Master Policy appear in red.

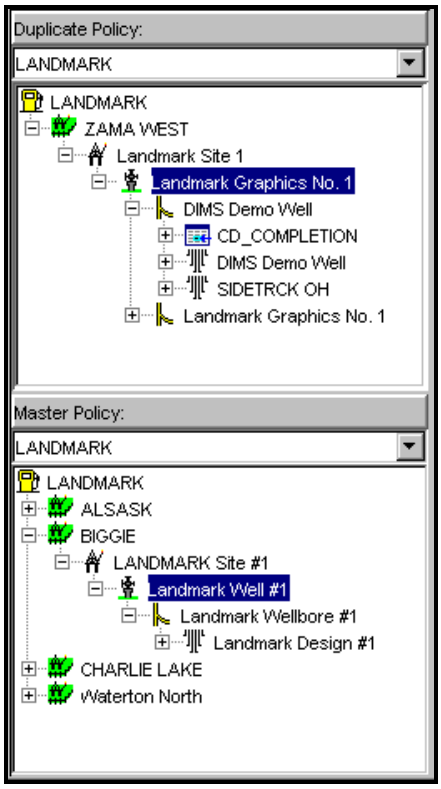


5. Click the **Merge** button to copy the Project from the Duplicate Policy (Company) to the Master Policy (Company).

Scenario Two - Same Well Different Names

To merge a Well that exists in both the Duplicate Policy (Company) and the Master Policy(Company), where that Well contains a different name in each Policy (Company), use the following procedure.

For example, a duplicate Well is named *Landmark Graphics No. 1* in the Duplicate Policy (Company) and named *Landmark Well #1* in the Master Policy (Company).



1. From the **Duplicate Policy** dropdown picklist, select the Policy (Company) containing the duplicate object. For example, navigate to the location of the *Landmark Graphics No. 1* Well in the Duplicate Policy tree.

2. From the **Master Policy** dropdown picklist, select the Policy (Company) where the duplicated Well will be copied. For example, navigate to the location of the *Landmark Well #1* Well in the Master Policy tree.

3. Select the **Data** tab to find a common attribute for both objects (e.g., the Wells WELL_LEGAL_NAME).

> **Note:**
>
> Use the Data tab to find a common attribute that ties the Wells together. For the purposes of illustration, although the Wells are the same they are named differently and by renaming one of them, the common attribute "Well Legal Name" can be used to merge their data.

4. To merge theses two Wells by the common attribute **Well Legal Name**, right-click on the Well (e.g., *Landmark Graphics No. 1)* and select **Rename** from the menu that appears.

> **Note:**
>
> When renaming a business object you must refresh the Data tab for the changes to take effect.

5. Rename the Well to match the name of the Well in the Master policy (e.g., *Landmark Well #1)* and press **Enter** on the keyboard.

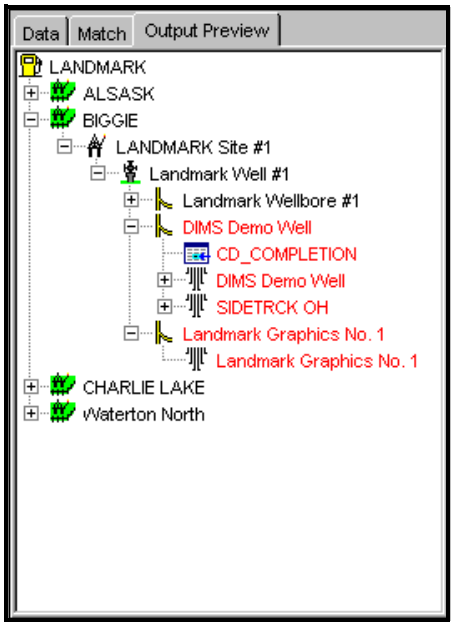
6. Select the **Match** tab and activate the checkbox for the common attribute. For example, the WELL_LEGAL_NAME attribute.

> **Note:**
>
> Business Objects can be merged using one or more common attributes. Once the attributes have been matched the business object will be merged based on these attributes (i.e., all non-common attributes from both objects will be copied over to the new "merged" business object).

7. Activate the **Merge only matched records** checkbox to merge only business objects that have been defined by the **Match** tab.

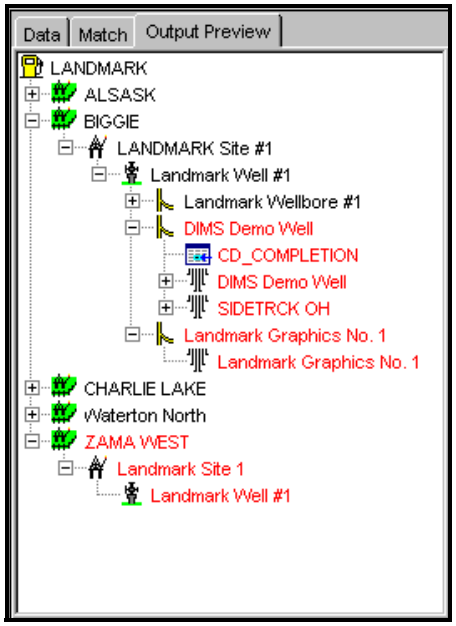
8. Select the **Output Preview** tab to view how the Well Explorer tree will appear once the merge has be completed. Changes made in the Master Policy appear in red.

If the **Merge only matched records** checkbox has been selected the Output Preview tab will look like this.



In the example above, only the "matched" Wells are merged. The business objects contained within the duplicate Well are copied to the Master Policy's Well.

If the **Merge only matched records** checkbox has NOT been selected the Output Preview tab will look like this.



In the example above, the "matched" Wells are merged AND a Project is copied over. The business objects contained within the duplicate

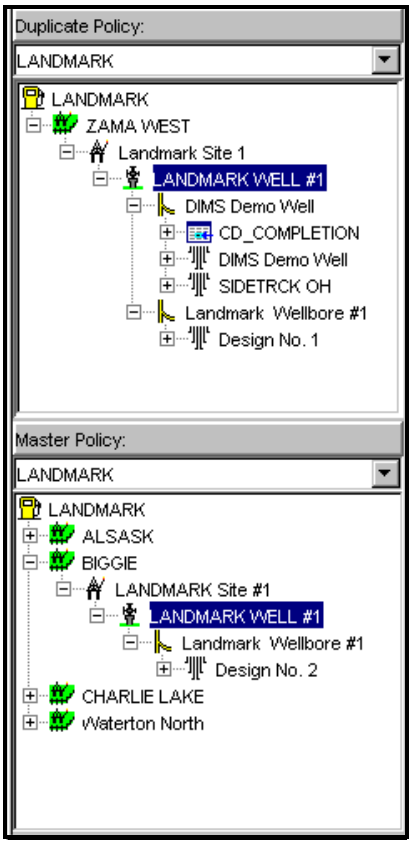
Well are copied to the Master Policy's Well and the duplicate Well should be deleted after the merge takes place.

9. Click the **Merge** button to copy the business objects from the Duplicate Policy (Company) to the Master Policy (Company).

Scenario Three - Same Well and Wellbore

To merge a Well that exists in both the Duplicate Policy (Company) and the Master Policy(Company), where that Well contains different Wellbores, and each Wellbore contains different Designs, use the following procedure.

For example, a duplicate Well that is named *Landmark Well #1* in both in the Duplicate Policy (Company) and the Master Policy (Company). The Duplicate Policies (Companies) Well contains the Wellbore named *Design No. 1*, which contains a Design named *Design No. 1*. The Master Policies (Companies) Well also contains the Wellbore named *Design No. 1*, which contains a Design named *Design No. 2*.



1. From the **Duplicate Policy** dropdown picklist, select the Policy (Company) containing the duplicate object. For example, navigate

to the location of the *Landmark Well #1* Well in the Duplicate Policy tree.

2. From the **Master Policy** dropdown picklist, select the Policy (Company) where the duplicated Well will be copied. For example, navigate to the location of the *Landmark Well #1* Well in the Master Policy tree.

3. Select the **Data** tab to find a common attribute for both objects (e.g., the Wells WELL_LEGAL_NAME).

> **Note:**
>
> Use the Data tab to find a common attribute that ties the Wells together. For the purposes of illustration, although the Wells are the same they are named differently and by renaming one of them, the common attribute "Well Legal Name" can be used to merge their data.

4. To merge theses two Wells by the common attribute **Well Legal Name**, select the **Match** tab and activate the checkbox next to the WELL_LEGAL_NAME attribute.

> **Note:**
>
> Business Objects can be merged using one or more common attributes. Once the attributes have been matched the business object will be merged based on these attributes (i.e., all non-common attributes from both objects will be copied over to the new "merged" business object).

5. Navigate to the location of the next business object to be merged (e.g., the Wellbore *Landmark Wellbore No. 1*) in the Duplicate Policy tree.

6. Navigate to the location of the matching business object to be merged (e.g., the Wellbore *Landmark Wellbore No. 1*) in the Master Policy tree.

7. Select the **Data** tab to find a common attribute for both objects (e.g., the Wellbores WELLBORE_NAME).

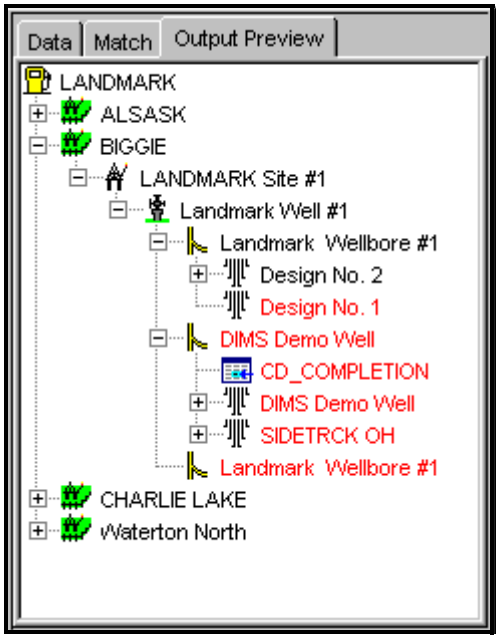
8. To merge theses two Wellbores by the common attribute **Wellbore Name**, select the **Match** tab and activate the checkbox next to the WELLBORE_NAME attribute.

> **Note:**
>
> Business Objects can be merged using one or more common attributes. Once the attributes have been matched the business object will be merged based on these attributes (i.e., all non-common attributes from both objects will be copied over to the new "merged" business object).

9. Activate the **Merge only matched records** checkbox to merge only business objects that have been defined by the **Match** tab.

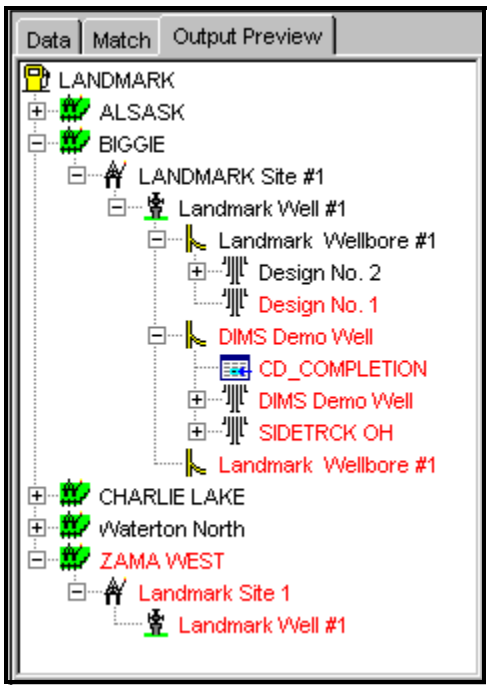
10. Select the **Output Preview** tab to view how the Well Explorer tree will appear once the merge has be completed. Changes made in the Master Policy appear in red.

If the **Merge only matched records** checkbox has been selected the Output Preview tab will look like this.



In the example above, the "matched" Wells and Wellbores are merged. The business objects contained within the duplicate Well and Wellbore are copied to the Master Policy's Well and Wellbore. Design No. 1 has been moved with the duplicate Wellbore.

If the **Merge only matched records** checkbox has NOT been selected the Output Preview tab will look like this.



In the example above, the "matched" Wells and Wellbores are merged AND a Project is copied over. The business objects contained within the duplicate Well and Wellbore are copied to the Master Policy's Well and Wellbore. Design No. 1 has been moved with the duplicate Wellbore. The duplicate Well should be deleted after the merge takes place.

Click the **Merge** button to copy the business objects from the Duplicate Policy (Company) to the Master Policy (Company).

> **Note:**
>
> Like Business Objects at any level in the Well Explorer tree can be merged using the EDM Data Merging tool with the exception of the Case, as it is at the bottom of the hierarchy.

Deleting a Business Object

To delete a Business Object:

1. Select the Object.
2. Press the **DEL** key or right-click and select **Delete** from the popup menu that appears.

   A dialog box appears warning that the object will be deleted.
3. Click **Yes** to delete the object or click **No** to cancel the operation.

   The Business object and everything contained within it is deleted.

> **Warning!**
>
> Deletion of Business Objects cannot be reversed.

Copy Legacy Files

As a final step in the migration of data from pre-EDM™ applications, copy the following legacy files to the specified Engineer's Desktop™ directories.

- EDM images/logos EDT_5000.1\Common Files\Images;
- WELLPLAN templates .TPT EDT_5000.1\WELLPLAN\Report\Output\Workspace;
- COMPASS magnetic files .GAM EDT_5000.1\COMPASS\Config\Geomagnetic Models;
- StressCheck templates .SCT EDT_5000.1\StressCheck\Client;
- PROFILE symbols .PSY EDT_5000.1\Common Files\WellSchematic\Symbols; PROFILE templates .PPC can be copied to any location choosen by the user.
- OpenWells filters .QRY users Windows profile e.g., C:\Documents and Settings\<user>\Application Data\Landmark\OpenWells\Queries.

COMPASS™ Program Post Migration Steps

Overview

Changes to the Survey Program and Definitive Path mechanism between the COMPASS™ 2000 program and the COMPASS programs 2003 and higher have affected the migration of data to the EDM™ database. These changes have caused differences between the bottom hole locations in COMPASS 2000 data, and COMPASS 2003 and higher data.

This section outlines the differences between the COMPASS 2000 program and the COMPASS 2003 and higher programs, which cause inconsistencies, and the procedures to fix the differences in COMPASS data.

Differences Found in a Well Coordinates Comparison

A semi-automated procedure compares Well Coordinates Log files in the COMPASS 2000 program to the COMPASS 2003 program and higher. This procedure verifies the quality of the data migration. An Excel spreadsheet is used to show the difference in Surface and Bottom Hole Local and Map Coordinates.

This section explains several differences that Landmark has observed. For the purposes of illustration, the frequency of occurrences of each difference is shown based on a 1600 well data set, which contains 50% land wells and 50% offshore wells.

Surface Location Differences

Surface UTM coordinates printed incorrectly in COMPASS 2000 well coordinates file. The surface coordinates in the COMPASS program releases 2003 and higher matched those in the COMPASS 2000 program. These coordinates need to be manually checked. In each case, based on the 1600 well data set, the surface locations in each version matched.

1. The problem occurs when the Well Coordinates cover Projects with different geodetic systems or zones and the sites are defined by Latitude/Longitude coordinates. A large difference in surface locations occurred (20/1600).

2. Additionally the COMPASS 2000 program reported incorrect coordinates for wells located from a Slot template. A small difference in surface locations occurred (2/1600).

Large Bottom Hole Depth and Location Differences (1000's of ft/m)

Large bottom hole depth and location differences (1000's of ft/m) indicate that a definitive survey is missing either in the COMPASS 2000 or COMPASS 2003 and higher programs. This is due to differences in data structure between COMPASS 2000 and COMPASS 2003 and higher programs.

1. In some cases, the definitive survey in the COMPASS 2000 program is a plan, while surveys have been created containing no survey stations. In COMPASS 2003 and higher programs, an Actual Design is created from these empty surveys, and it is the

Actual Design that COMPASS 2003 and higher programs use when generating the well coordinates file. In effect, when comparing the data, the bottom hole location of the principal plan is used in the COMPASS 2000 program, and the bottom hole of the empty survey is used in COMPASS 2003 and higher programs, resulting in large difference in bottom hole depth. The plans for all wellbores were checked, and all were migrated correctly (10/1600).

2. In some cases, plans constructed in the COMPASS 2000 program failed to calculate in 2003 and higher because of different restrictions. In the COMPASS 2000 program it is possible to leave the editor and save a plan that had construction errors. In COMPASS 2003 and higher programs this is not possible. In these cases the definitive path exists in the COMPASS 2000 program and not in 2003 and higher (1/1600).

3. In some cases, Wellbores created did not have any surveys of plans in the COMPASS 2000 program. These are listed as lines in the COMPASS 2000 Well Coordinates Log, but the lines are not found in the files of COMPASS 2003 and higher programs. The result is a mismatch in all of the following lines.(2/1600).

Medium Bottom Hole Location Differences (10-100's of ft/m)

Medium bottom hole location differences indicate that the definitive surveys are built from different data in the COMPASS 2000 program than in releases 2003 and higher.

1. In a number of cases, the Survey Program in the COMPASS 2000 program ends in a plan tied onto surveys. The data structure of COMPASS 2003 and higher programs require that the Plan is inserted into the Planned Design and the surveys are inserted into the Actual Design. The Well Coordinates Log for the COMPASS 2000 program only shows the TD location of the Plan. The Well Coordinates Log of the COMPASS 2003 and higher programs shows the TD location of the Surveys. Plans checked in all cases were found to have been migrated correctly into COMPASS 2003 and higher programs (5/1600).

2. A number of wellpaths are made up from 'inclination-only' surveys. In the COMPASS 2000 program the survey editor managed these by computing the coordinates vertically below the start point. Unfortunately when these are built in the definitive path, the coordinates are computed using the azimuth value, giving

coordinates that are north (and sometimes east) of the start point. This is a bug that is fixed in COMPASS programs 2003 and higher. The BHL comparisons for Totco surveys show a difference in BHNS only (sometimes BHEW only) coordinates. In this case, COMPASS programs 2003 and higher have corrected a problem in the COMPASS 2000 program data (150/1500).

3. Differences in projections showed up as bottom hole measured depth (BHMD) differences: In the COMPASS 2000 program the survey program allowed a projection beyond the end of a plan. In the COMPASS 2003 and higher programs this is not allowed, and the definitive path stops at the TD of the Plan. Also the COMPASS 2000 program in a number of examples had a projected TD that was different from the projected depth in the Survey program. COMPASS programs 2003 and higher handle this correctly. In both cases COMPASS programs 2003 and higher correct an inconsistency in the COMPASS 2000 program's data (10/1500).

Small Bottom Hole Location Differences (<10'/m)

1. Some plans compute differently (tighter tolerances) in COMPASS 2003 and higher programs than in the COMPASS 2000 program. These are plans with Optimum Align, Build Turn sections and also Slant/Swell profiles. The differences are small up to 1' in MD (15/1600).

2. Slight Difference in bottom hole location for True North wells, and azimuth of all surveys. In the COMPASS 2000 program grid convergence is calculated at the site level, whereas in COMPASS 2003 and higher programs it is done at well level. This results in slight differences in bottom hole locations, and azimuths for those wells where the wellhead location is a long distance from the site center location. Calculation in the COMPASS 2003 and higher programs is more correct.

Errors in Migration to be Fixed in a Future Release of COMPASS Software.

These are small to medium differences in bottom hole location (1-100') that cannot be explained by any of the above reasons. These occur because something complex was done in the survey program,

1. Splicing of surveys in the COMPASS 2000 survey program. There were two wellbores where the survey program depths were used to

skip misrun MWD surveys. These did not migrate correctly. In COMPASS 2003 and higher programs the misrun stations may be eliminated by setting the Misrun type in the last column of the survey editor. This station will not get calculated and will not get included in the definitive path (2/1600).

2. Tying onto the definitive path, where the definitive path does not exactly represent the surveys from tie-ons (5/1600). The explanation is given as a separate section (see“Tying onto Definitive Paths” on page 143).

3. Use of planned program options in the COMPASS 2000 program like ‘use in preference’ and mismatch between program depths and survey depths when Planning Mode is turned on (1/1600 higher frequency in some data sets).

Tying onto Definitive Paths

There is a problem when tying onto the definitive path; the definitive path does not exactly represent the surveys from tie-ons (5/1600).

This is a big issue in migrating to COMPASS 2003 and higher programs. This feature was provided in COMPASS programs (5 through 2000) as a convenience to help users create new tied on surveys without having to think about which survey to tie onto. Later it was found to provide unique and valuable functionality that was not found in other systems. It is used in the following scenario.

User wants to sidetrack from an original hole, just below a casing shoe, using the best possible position to tie onto. Unfortunately there is a Gyro that does not extend to the casing depth and an MWD survey run deeper than the casing shoe. The MWD survey is tied to surface, but the definitive path of the original hole has the MWD tied to the bottom of the Gyro. On the sidetrack the user wants to tie and interpolate into the section between the MWD and the Gyro, and the definitive path on the original hole.

The initial versions of the EDM COMPASS program did not handle this, and there were protests from some serious users. The option was restored in 2003.11 build 2, but still restricted to identifying the survey to tie onto. The data migration does not handle this, and these wells should be manually checked. These types of tie-on are reported as error messages in the COMPASS Post Migration Log and left as User tie-on. These wells need to be reviewed and the plans or surveys manually re-tied.

Differences in Wellpaths Bottom Hole Locations

In cases where plans—COMPASS 2000 program—were copied from well to well and retained, the original plans projected depth. The plans were modified to a different TD but the definitive path retained the original projected depth, so the definitive ended much deeper than the well planner intended. COMPASS 2003 and higher programs do not use this projected depth, they use the end of the plan. In this case COMPASS 2003 and higher programs have corrected a problem in the COMPASS 2000 program.

Differences in Error Ellipsoid Dimensions

In almost all cases there will be differences in the order of <0.25'. This is expected and has been checked manually. If the wellpath is different then the errors will be different.

1. **Cone of Error Models -** A number of differences are found where wellbores drop in angle. This is being investigated. There is a bug in the COMPASS 2003.11 program that shows the error values as ¼ of their values in the COMPASS 2000 program. This does not affect the data as long as the tools are not saved back to the database (DE627260). This has been fixed for release 2003.21 and higher.

2. **Systematic Error Model -** No known problems have been observed.

3. **SCWSA Error Model -** In almost all cases, these migrate correctly. There is a computation difference between versions with ISCWSA Gyro type 3 on example well 3. This is currently being investigated.

Incomplete migrations from Legacy systems.

There are some problems in data that was migrated to the COMPASS program from a non-standard migration. This caused problems in the EDM migrated data. These problems need to be fixed on an individual basis. The problems can be removed by manually saving the data in the COMPASS 2000 program.

Comparing COMPASS Programs, Release 2000 vs. 2003 and Higher Data

This section outlines the procedure for comparing data migrated to COMPASS program releases 2003 and higher with the 2000 version of the data. Prior to implementing this procedure the following two steps *must* be completed:

- Apply the most recent COMPASS 2000 patch, and launch the application to recompute all definitive paths,
- Generate the Well Coordinates file, which will be used in the comparison after the migration,
- Migrate COMPASS 2000 data to the COMPASS 2003 program or higher (Map, Migrate, and Merge data),
- Launch the COMPASS 2003 or higherprogram to compute all definitive surveys.

The following procedure is run on a Company basis; if the projects are large, the Log file may be run on selected Projects.

Preparation - Before Running the Well Coordinates Files Check the following:

1. Verify that Well (slot) names are turned off in COMPASS 2003 and higher programs (**View >Wellname >Slot**).
2. Verify that both the COMPASS 2000 program and the COMPASS 2003 and higher programs are in the same display units and are on the same general datum reference. (i.e., TVDs to system datum is turned off)
3. If possible, it is recommended to Regenerate all Definitive paths in the COMPASS 2000 program. This will correct a number of problems with the COMPASS 2000 data from previous builds.

Generating the Well Coordinates Files

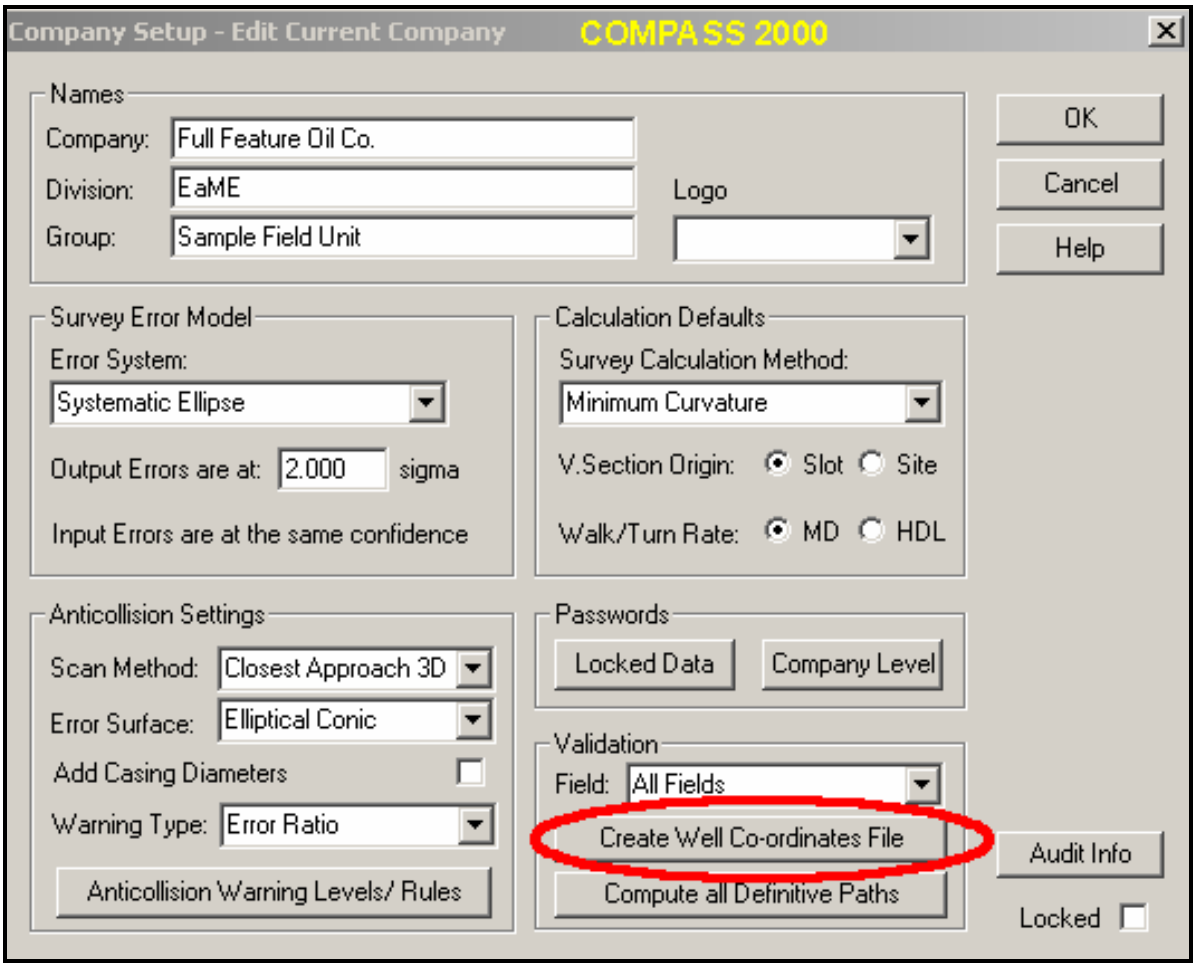
A spreadsheet called *WellCoordinatesGeneral.xls,* located on the EDT 5000.1 download in \Products\EDT\Docs, is used for this procedure.

This spreadsheet makes comparisons between 2000 and 2003 and higher data. The following steps involve the population of this spreadsheet. The spreadsheet contains the following tabs: **2000**, **2003**, **Compare**, **Casing**.

1. In the COMPASS 2000 program, generate a Well Coordinates File. In Customer Properties, select **Create Well Coordinates File**. The *WellCoordinates.log* file is created in the Landmark\DWS\COMPASS\output directory.

   If you have a large data set, then it may be better to select the data by field.

   Note: The Well Coordinates File is cumulative, and later generations of the log will be appended to the file. It is recommended to use a clean run; delete or rename the file beforehand.



2. Open Well Coordinates File log, and copy the contents into the *WellCoordinatesGeneral* Spreadsheet, **2000** tab, 1st row ,1st column.

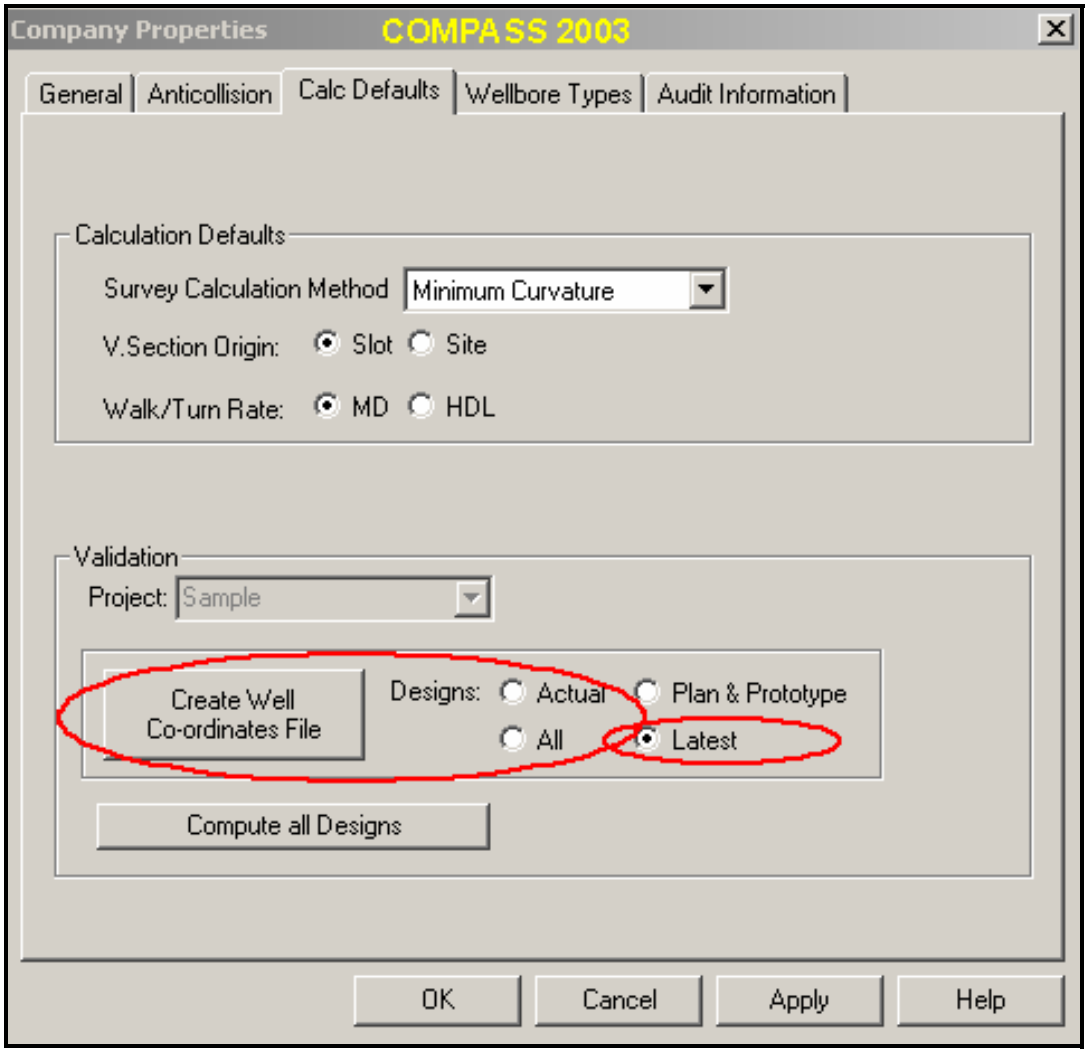
3. Select the first column and convert the text to columns (**Data >Text to Columns**). Use the space delimiter to separate the fields.

4. Select all of the columns and sort alphabetically by Well Name and Strack. (**Data > Sort**, Column A, Column B).

5. Generate a Well Coordinates File from the COMPASS 2003 or higher program. Select "Latest Designs" instead of all. The COMPASS 2000 program only has one definitive path per wellbore. The WellCoordinates.log file is created in the Landmark\EDT_5000.1\COMPASS\output directory, where the Engineer's Desktop is installed.

   If you have a large data set, then it may be better to select the data by field.

   Note: The Well Coordinates File is cumulative, and later generations of the log will be appended to the file. It is recommended to use a clean run, then delete or rename the file beforehand.



6. Paste the contents of the file into **2003** tab of the *WellCoordinatesGeneral.xls* located on Volume 6 CD, 1st row, 1st column.

7. Select the first column and convert the text to columns (**Data >Text to Columns**) Use the following delimiter to separate the fields.

   In versions of the COMPASS 2003 program prior to release 2003.11.0.3, the file format uses a comma delimiter to parse the file correctly. 2003.11.0.3 uses a space delimiter to parse the file correctly. Versions 2003.14 and greater uses a tab delimiter to parse the file correctly.

Occasionally, some Well or Wellbore names in the COMPASS 2003 and higher programs WellCoordinates.csv file contain commas; this prevents the Text to Columns from working correctly. These differences are obvious, and the lines will have to be parsed individually.

8. In the COMPASS program 2003 and higher file, the *Wellbore* column does not correspond with the *Strack* column in 2000. To get this to match with the COMPASS 2000 program, do the following:

   a. Insert a column to be column **C,**

   b. Convert column **B** Text to Columns using '\' as the delimiter,

   c. Delete the new column **C** so that the rows move back left.

   The wellbore names should now correspond with Strack column in the COMPASS 2000 program.

9. Select all of the columns and sort alphabetically by Well Name and Wellbore. (**Data > Sort**, Column A, Column B). They should now be in the same alphabetic order as the 2000 Tab.

10. Go to the **Compare** Tab and make sure that the formulas match up with the columns on 2000 and 2003 (i.e., Compare!C4=2000!C4-2003!C4)

11. Verify that the Well and Wellbore names match up on the **Compare** tab. If they do not match, the mismatch will show up as a series of "!!!!!!!!!!!!!!!!!!!!!!!!!!" marks for all lines below the mismatch.

    Occasionally there will be a wellbore in the COMPASS 2000 program that didn't make a Design in the COMPASS 2003 and higher program because it has no plans or surveys. A blank line must be inserted for the missing data, and the formulas match-up must be verified.

Other things to note…

Custom Geodetic Systems

Once the data migration has been run and the COMPASS program is launched, a Message Box may appear stating that certain custom Geodetic Systems and/or Geodetic Datum are missing. The COMPASS program will not process these Companies and will prevent access to them.

To proceed, the custom geodetic system (.GDF file) must be loaded into COMPASS 2003 or higher program. This is done by opening the Geodetic Calculator and clicking the button **Load Geodetic System File**. Restart the COMPASS program, and the blocked data will be processed.

Additionally, a message box in the COMPASS 2003 program may indicate that certain Geomagnetic Model files may be missing that are used in the COMPASS 2000 data. These may be obtained from Landmark support and loading the file (.GDF or .DAT) into Landmark\EDT_5000.1\COMPASS\config\Geomagnetic Files

Errors in Data Migration

The data migration program will report errors in the DataMigrationLog file (Landmark\EDT_5000.1\EDM\Data Migration\DataMigrationLog.txt). On Oracle migration there may be one error for mapping the SEDEPTH table. This is not important except for customers using the SESTEM module. In this case there was a problem in the original COMPASS 2000 Oracle script that failed to create this table. If a number of errors are reported and appear in this file, send the file to Landmark support for the problems to be resolved.

Errors in Post Migration Processing in the COMPASS Program

When the COMPASS 2003 or higher program is launched after the migration of data, a PostMigration process recomputes all definitive paths. It will also attempt to determine tie-on surveys for all the migrated surveys that tie-onto ‘Definitive Path’ in the COMPASS 2000 program. This process generates a log file called EDT_5000.1\COMPASS\output\PostMigration.log. This will list all of the possible errors that are produced.

Examples of Error Messages produced by the Post Migration:

1. Resetting survey/plan XXX to user tie on **- couldn't figure out parent**. The survey in the COMPASS 2000 program has been tied onto “Definitive Path”, but there is no real survey that spans the tie-on depth. It is recommended to check these surveys for the correct tie-on.

2. **Circular wellbore tie on detected**: XXX. Cleared parent wellbore key. In the COMPASS 2000 program, it was possible to have wellbore A tied onto wellbore B, and wellbore B tied onto wellbore A. It is recommended that these wells and wellbores are checked for the correct sidetrack dependency.

3. **MessageBox request ignored**: Wellbore XXX, tool GOOD GYRO at 9652.05. Gyro Term: 1/cos(inc) is used where the inclination is > 85 deg. The Systematic error model has a term for Gyroscopes that explodes at 90 degrees because horizontal wells were not known when the systematic error model was constructed. This Gyro type should not have been applied to these wells. It is recommended to apply a more modern Gyro model to these surveys.

Appendix A: Configuring the Data Migration Toolkit

Overview

Configuration of the tools included in the Data Migration Toolkit may be required, depending on the location and type of the legacy database.

Additional configuration may be required if the legacy database is Oracle or SQL Server 2005 Express.

Oracle

EDM™ databases running in Oracle require additional configuration before running the Drilling Data Migration tool. This section documents the process for configuring EDM on Oracle.

Create the Staging Area User

A Staging Area user (EDM_SA) must be created in the Oracle instance containing the EDM database. The EDM_SA user can be created by running the **CreateDB.sql** script located in the Landmark\EDT_5000.1\EDM\Oracle\dbcreate folder once the db_create.exe has been run. When created, the **EDM_SA** user has a password of **EDM_SA** .

Ensure the EDM_SA user's default tablespace has enough space to hold the entire contents of any source databases that will be transferred.

In order to calculate an initial value for EDM_SA user's default tablespace requirements for the COMPASS™ or WELLPLAN™ programs, the expected number of wellpaths should be estimated:

Required Space (MB) =

[(60KB * number of Wells) + (30KB * number of Wellbores) + (3KB * number of Assemblies) + (25KB * number of Events) + (10KB * number of Daily Reports) + (30KB * number of Rigs) + (2KB * number of AFE Reports) + (1KB * number of Activities) + (1KB * number of Scenarios) + (2KB * number of Cases)] * 1024

TIP:

Consider using tablespaces with the autoextend feature enabled to avoid running out of space.

Oracle DBA Studio may be used to create the user, or execute the following SQL command in **SQL*Plus** when logged in as the **system** user.

CREATE USER EDM_SA IDENTIFIED BY EDM_SA DEFAULT TABLESPACE <default_tablespace> TEMPORARY TABLESPACE <temporary_tablespace>;

Note:

Replace <default_tablespace> and <temporary_tablespace> with the desired tablespace names (e.g., EDM _DATA, EDM_TEMP).

Grant Roles to the Staging Area User

Grant the **CONNECT** and **RESOURCE** roles to the Staging Area User.

Execute the following SQL command in **SQL*Plus** when logged in as the **system** user.

```
GRANT RESOURCE, CONNECT TO EDM_SA;
```

Grant All Privileges Role to the EDM User

Grant the database administrator privileges to the user owning the EDM database that will be used with the Data Migration Tool.

IMPORTANT!

This should be a temporary users configured ONLY for the purposes of running the Data Migration. Furthermore, this user should be removed once the migration of data is complete.

Execute the following SQL command in **SQL*Plus** when logged in as the **system** user.

```
GRANT ALL PRIVILEGES TO <EDM user>;
```

Note:

Replace <EDM_user> with the name of the Oracle user containing the EDM database (e.g., EDM).

The DBA role is required when running the Data Migration Tool, but for security reasons it is desirable to remove the DBA role from the EDM user when finished running the Data Migration Tool.

To remove the DBA role, execute the following SQL command in **SQL*Plus** when logged in as the **system** user.

Replace <EDM_user> with the name of the Oracle user containing the EDM database.

REVOKE DBA FROM <EDM_user>;

Add Custom Stored Functions

When the Db_Create.exe is run, the **DatabaseStoredFunctions.class** file is copied to the **C:\TEMP** directory on the same physical machine running the Oracle server; the stored procedures are then created by the master script CreateDB.sql.

If the creation process is run on a client machine, the **DatabaseStoredFunctions.class** file must be copied manually; and the "create directory" statement in the CreateDB.sql must be edited with the valid path to the .CLASS file.

If **C:\TEMP** does not exist, then another directory may be used by substituting **C:\TEMP** in the **CreateDB.sql** script with the desired directory. This script file is located in the Landmark\EDT_5000.1\EDM\Oracle\dbcreate folder once the db_create.exe has been run.

Execute the **Dbcreate.sql** script using **SQL*Plus** when logged in as the user owning the EDM database.

After executing **Dbcreate.sql** the **DatabaseStoredFunctions.class** file may be deleted, as it is no longer needed.

Data Migration Tool configurations required on Oracle are now complete.

MSDE and Microsoft SQL Server Express 2005

When migrating DIMS™ data to the EDM database, remember to use the following commands: “Action > Load Picklist Metadata” on page 85 and “Action > Load System Metadata” on page 86.

Starting with release 5000.1, MSDE is replaced by Microsoft SQL Server Express 2005.

Appendix B: Mapping Sets

Overview

The Drilling Field Mapping tool is shipped with complete mapping sets for the DIMS™, COMPASS™, and WELLPLAN™ applications. Mapping sets for CasingSeat™ and StressCheck™ are not necessary, as data for these applications are not stored in a database and therefore cannot be migrated using the Drilling Data Migration tool.

> **Note:**
>
> There should be no reason to modify the mapping sets shipped for the COMPASS and WELLPLAN software.
>
> This data migration functionality has been developed to complement future releases of the Engineer's Desktop™ that may include applications that require customized mapping sets.
>
> Mapping sets for DIMS software may need some modification depending on the client-specific changes made in the application.

If after reviewing the mapping sets for the COMPASS and WELLPLAN applications it is necessary to make some changes, the mapping set that is shipped with this version can be copied and modified.

To view a mapping set see Drilling Field Mapping - "Viewing Migration SQL" on page 56.

Modifications to the Mapping Set for DIMS™ Software

Some modifications may be necessary for the DIMS™ mapping set to accommodate customizations made to the DIMS system. Any fields in the DIMS application that have been used in an unconventional way (any deviation from the DIMS system shipped by Landmark) should be reviewed.

For example:

Clients may use different columns for the same purpose. If a client uses fields other than DAYCOST.class, DAYCOST.code, and DAYCOST.subcode for cost accounting codes, all additional fields used must be mapped to the DM_DAILYCOST cost_class, cost_code, and cost_subcode before the migration will successfully reflect all data from the legacy database.

If a client used a field for a different purpose than that intended, an appropriate field may now exist in EDM, and the data from that field can be mapped into EDM before the migration will successfully reflect all data from the legacy database.

Appendix C: Unit Conversion Tables

Overview

The migration of DIMS™ legacy data to the EDM™ database can become complicated as a result of the conversion of units.

The following tables outline the unit measures and their equivalent numeric value for DIMS and EDM.

The DIMS table is FDD_UNIT_MEASURES. The EDM table is UMS_SYS_UNIT_MEASURES.

FDD_UNIT_MEASURES Table

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI- PLIER	OFF- SET
Diameter	133	SI to SI	\xb5	\xb5	1	0
Diameter	133	SI to API	\xb5	\xb5	1	0
Diameter	133	MIXED to API	\xb5	\xb5	1	0
Diameter	133	DEX API Export	\xb5	\xb5	1	0
Diameter	133	API to SI	\xb5	\xb5	1	0
Diameter	133	API to API	\xb5	\xb5	1	0
Volume	132	SI to SI	MMm\xb3	MMm\xb3	1	0
Volume	132	SI to API	MMm\xb3	MMft\xb3	0.02831685	0
Volume	132	MIXED to API	MMm\xb3	MMft\xb3	35.31466247	0
Volume	132	DEX API Export	MMft\xb3	MMft\xb3	1	0
Volume	132	API to SI	MMft\xb3	MMm\xb3	35.31466247	0
Volume	132	API to API	MMftxb3	MMft\xb3	1	0
Pressure	131	SI to SI	kg/cm\xb2	kg/cm\xb2	1	0
Pressure	131	SI to API	kg/cm\xb2	psi	1	0
Pressure	131	MIXED to API	kg/cm\xb2	psi	1	0
Pressure	131	DEX API Export	psi	psi	1	0
Pressure	131	API to SI	psi	kg/cm\xb2	1	0
Pressure	131	API to API	psi	psi	1	0
Volume	130	SI to SI	Mm\xb3	Mm\xb3	1	0
Volume	130	SI to API	Mm\xb3	Mft\xb3	0.02831685	0
Volume	130	MIXED to API	Mm\xb3	Mft\xb3	35.31466247	0
Volume	130	DEX API Export	Mft\xb3	Mft\xb3	1	0
Volume	130	API to SI	Mft\xb3	Mm\xb3	35.31466247	0
Volume	130	API to API	Mftxb3	Mft\xb3	1	0
Volume (Imp. gal)	129	SI to SI	L	L	1	0
Volume (Imp. gal)	129	SI to API	L	gal	0.219969	0
Volume (Imp. gal)	129	MIXED to API	L	gal	0.219969	0
Volume (Imp. gal)	129	DEX API Export	gal	gal	1	0
Volume (Imp. gal)	129	API to SI	gal	L	4.54609	0
Volume (Imp. gal)	129	API to API	gal	gal	1	0
Volume (US gal)	128	SI to SI	L	L	1	0
Volume (US gal)	128	SI to API	L	gal	0.264172	0
Volume (US gal)	128	MIXED to API	gal	gal	1	0
Volume (US gal)	128	DEX API Export	gal	gal	1	0
Volume (US gal)	128	API to SI	gal	L	3.785412	0
Volume (US gal)	128	API to API	gal	gal	1	0
Length	127	SI to SI	mm	mm	1	0
Length	127	SI to API	mm	in	25.4	0
Length	127	MIXED to API	in	in	1	0
Length	127	DEX API Export	in	in	1	0
Length	127	API to SI	in	mm	0.039370078 7	0
Length	127	API to API	in	in	1	0
Flow Rate	126	SI to SI	SCM/min	SCM/min	1	0
Flow Rate	126	SI to API	SCM/min	SCF/min	0.02831685	0
Flow Rate	126	MIXED to API	SCF/min	SCF/min	1	0
Flow Rate	126	DEX API Export	SCF/min	SCF/min	1	0
Flow Rate	126	API to SI	SCF/min	SCM/min	35.31466247	0
Flow Rate	126	API to API	SCF/min	SCF/min	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Volume	125	SI to SI	sk	sk	1	0
Volume	125	SI to API	sk	sk	1	0
Volume	125	MIXED to API	sk	sk	1	0
Volume	125	DEX API Export	sk	sk	1	0
Volume	125	API to SI	sk	sk	1	0
Volume	125	API to API	sk	sk	1	0
Mass	124	SI to SI	g	g	1	0
Mass	124	SI to API	g	g	1	0
Mass	124	MIXED to API	g	g	1	0
Mass	124	DEX API Export	g	g	1	0
Mass	124	API to SI	g	g	1	0
Mass	124	API to API	g	g	1	0
Area	123	SI to SI	m\xb2	m\xb2	1	0
Area	123	SI to API	m\xb2	ft\xb2	0.0929031	0
Area	123	MIXED to API	ft\xb2	ft\xb2	1	0
Area	123	DEX API Export	ft\xb2	ft\xb2	1	0
Area	123	API to SI	ft\xb2	m\xb2	10.76391	0
Area	123	API to API	ft\xb2	ft\xb2	1	0
Capacity	122	SI to SI	l/stk	l/stk	1	0
Capacity	122	SI to API	l/stk	bbl/stk	158.9873042	0
Capacity	122	MIXED to API	bbl/stk	bbl/stk	1	0
Capacity	122	DEX API Export	bbl/stk	bbl/stk	1	0
Capacity	122	API to SI	bbl/stk	l/stk	0.00628981	0
Capacity	122	API to API	bbl/stk	bbl/stk	1	0
Capacity	121	SI to SI	l/stk	l/stk	1	0
Capacity	121	SI to API	l/stk	gal/stk	0.264172037	0
Capacity	121	MIXED to API	gal/stk	gal/stk	1	0
Capacity	121	DEX API Export	gal/stk	gal/stk	1	0
Capacity	121	API to SI	gal/stk	l/stk	3.785412	0
Capacity	121	API to API	gal/stk	gal/stk	1	0
Yield	120	SI to SI	m\xb3/t	m\xb3/t	1	0
Yield	120	SI to API	m\xb3/t	bbl/ton	0.175253801	0
Yield	120	MIXED to API	bbl/ton	bbl/ton	1	0
Yield	120	DEX API Export	bbl/ton	bbl/ton	1	0
Yield	120	API to SI	bbl/ton	m\xb3/t	5.706010324	0
Yield	120	API to API	bbl/ton	bbl/ton	1	0
Yield	119	SI to SI	m\xb3/t	m\xb3/t	1	0
Yield	119	SI to API	m\xb3/t	ft\xb3/ton	0.031214151	0
Yield	119	MIXED to API	ft\xb3/ton	ft\xb3/ton	1	0
Yield	119	DEX API Export	ft\xb3/ton	ft\xb3/ton	1	0
Yield	119	API to SI	ft\xb3/ton	m\xb3/t	32.03675139	0
Yield	119	API to API	ft\xb3/ton	ft\xb3/ton	1	0
Tonne-Kilometer	118	SI to SI	t-km	t-km	1	0
Tonne-Kilometer	118	SI to API	t-km	tn-mi	0.684944523	0
Ton-Miles	118	MIXED to API	tn-mi	tn-mi	1	0
Ton Miles	118	DEX API Export	tn-mi	tn-mi	1	0
Ton-Miles	118	API to SI	tn-mi	t-km	1.459972254	0
Ton Miles	118	API to API	tn-mi	tn-mi	1	0
Barometric Pressure	117	SI to SI	kPa	kPa	1	0
Barometric Pressure	117	SI to API	kPa	in	3.38639	0
Barometric Pressure	117	MIXED to API	in	in	1	0
Barometric Pressure	117	DEX API Export	in	in	1	0
Barometric Pressure	117	API to SI	in	kPa	0.2953	0
Barometric Pressure	117	API to API	in	in	1	0
Barometric Pressure	116	SI to SI	kPa	kPa	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Barometric Pressure	116	SI to API	kPa	bar	100	0
Barometric Pressure	116	MIXED to API	bar	bar	1	0
Barometric Pressure	116	DEX API Export	bar	bar	1	0
Barometric Pressure	116	API to SI	bar	kPa	0.01	0
Barometric Pressure	116	API to API	bar	bar	1	0
per Unit of Measure-ment	115	SI to SI	/m	/m	1	0
per Unit of Measure-ment	115	SI to API	/m	/ft	3.280839895	0
per Unit of Measure-ment	115	MIXED to API	/ft	/ft	1	0
per Unit of Measure-ment	115	DEX API Export	/ft	/ft	1	0
per Unit of Measure-ment	115	API to SI	/ft	/m	0.3048	0
per Unit of Measure-ment	115	API to API	/ft	/ft	1	0
Power [Bits ONLY]	114	SI to SI	kW	kW	1	0
Power [Bits ONLY]	114	SI to API	kW	HHP/in\xb2	0.7456999	0
Power [Bits ONLY]	114	MIXED to API	HHP/in\xb2	HHP/in\xb2	1	0
Power [Bits ONLY]	114	DEX API Export	HHP/in\xb2	HHP/in\xb2	1	0
Power [Bits ONLY]	114	API to SI	HHP/in\xb2	kW	1.340482574	0
Power [Bits ONLY]	114	API to API	HHP/in\xb2	HHP/in\xb2	1	0
Degrees Baume	113	SI to SI			1	0
Degrees Baume	113	SI to API			1	0
Degrees Baume	113	MIXED to API			1	0
Degrees Baume	113	DEX API Export			1	0
Degrees Baume	113	API to SI			1	0
Degrees Baume	113	API to API			1	0
Pressure	112	SI to SI	kPa	kPa	1	0
Pressure	112	SI to API	kPa	psi	6.894757	0
Pressure	112	MIXED to API	psi	psi	1	0
Pressure	112	DEX API Export	psi	psi	1	0
Pressure	112	API to SI	psi	kPa	0.145037744	0
Pressure	112	API to API	psi	psi	1	0
Time Period - Hours	109	SI to SI	hr	hr	1	0
Time Period - Hours	109	SI to API	hr	hr	1	0
Time Period - Hours	109	MIXED to API	hr	hr	1	0
Time Period - Hours	109	DEX API Export	hr	hr	1	0
Time Period - Hours	109	API to SI	hr	hr	1	0
Time Period - Hours	109	API to API	hr	hr	1	0
Time Period - Days	108	SI to SI	days	days	1	0
Time Period - Days	108	SI to API	days	days	1	0
Time Period - Days	108	MIXED to API	days	days	1	0
Time Period - Days	108	DEX API Export	days	days	1	0
Time Period - Days	108	API to SI	days	days	1	0
Time Period - Days	108	API to API	days	days	1	0
Capacity	107	SI to SI	m\xb3/m	m\xb3/m	1	0
Capacity	107	SI to API	m\xb3/m	bbl/ft	0.5126118	0
Capacity	107	MIXED to API	bbl/ft	bbl/ft	1	0
Capacity	107	DEX API Export	ft\xb3\ft	bbl/ft	0.1781075952	0
Capacity	107	API to SI	bbl/ft	m\xb3/m	1.9171342	0
Capacity	107	API to API	bbl/ft	bbl/ft	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Volume	106	SI to SI	cm\xb3	cm\xb3	1	0
Volume	106	SI to API	cm\xb3	cc	1	0
Volume	106	MIXED to API	cc	cc	1	0
Volume	106	DEX API Export	cc	cc	1	0
Volume	106	API to SI	cc	cm\xb3	1	0
Volume	106	API to API	cc	cc	1	0
Percentage (wt)	105	SI to SI	wt%	wt%	1	0
Percentage (wt)	105	SI to API	wt%	wt%	1	0
Percentage (wt)	105	MIXED to API	wt%	wt%	1	0
Percentage (wt)	105	DEX API Export	wt%	wt%	1	0
Percentage (wt)	105	API to SI	wt%	wt%	1	0
Percentage (wt)	105	API to API	wt%	wt%	1	0
Concentration	104	SI to SI	kg/m\xb3	kg/m\xb3	1	0
Concentration	104	SI to API	kg/m\xb3	ppb	2.85301	0
Concentration	104	MIXED to API	ppb	ppb	1	0
Concentration	104	DEX API Export	ppb	ppb	1	0
Concentration	104	API to SI	ppb	kg/m\xb3	0.350507008	0
Concentration	104	API to API	ppb	ppb	1	0
Concentration	103	SI to SI	mg/L	mg/L	1	0
Concentration	103	SI to API	mg/L	mg/L	1	0
Concentration	103	MIXED to API	mg/L	mg/L	1	0
Concentration	103	DEX API Export	mg/L	mg/L	1	0
Concentration	103	API to SI	mg/L	mg/L	1	0
Concentration	103	API to API	mg/L	mg/L	1	0
Volume	102	SI to SI	cm\xb3	cm\xb3	1	0
Volume	102	SI to API	cm\xb3	mL	1	0
Volume	102	MIXED to API	mL	mL	1	0
Volume	102	DEX API Export	mL	mL	1	0
Volume	102	API to SI	mL	cm\xb3	1	0
Volume	102	API to API	mL	mL	1	0
Fluid Loss	101	SI to SI	mL	mL	1	0
Fluid Loss	101	SI to API	mL	cc/30min	1	0
Fluid Loss	101	MIXED to API	cc/30min	cc/30min	1	0
Fluid Loss	101	DEX API Export	cc/30min	cc/30min	1	0
Fluid Loss	101	API to SI	cc/30min	mL	1	0
Fluid Loss	101	API to API	cc/30min	cc/30min	1	0
Density	100	SI to SI	kg/m\xb3	kg/m\xb3	1	0
Density	100	SI to API	kg/m\xb3	ppg	0.1198264	0
Density	100	MIXED to API	ppg	ppg	1	0
Density	100	DEX API Export	ppg	ppg	1	0
Density	100	API to SI	ppg	kg/m\xb3	0.008345404	0
Density	100	API to API	ppg	ppg	1	0
Depth	99	SI to SI	m	m	1	0
Depth	99	SI to API	m	ft	0.3048	0
Depth	99	MIXED to API	ft	ft	1	0
Depth	99	DEX API Export	ft	ft	1	0
Depth	99	API to SI	ft	m	3.280839895	0
Depth	99	API to API	ft	ft	1	0
Direction/Bearing	98	SI to SI	\xb0	\xb0	1	0
Direction/Bearing	98	SI to API	\xb0	\xb0	1	0
Direction/Bearing	98	MIXED to API	\xb0	\xb0	1	0
Direction/Bearing	98	DEX API Export	\xb0	\xb0	1	0
Direction/Bearing	98	API to SI	\xb0	\xb0	1	0
Direction/Bearing	98	API to API	\xb0	\xb0	1	0
Volume - Gas	97	SI to SI	m\xb3	m\xb3	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Volume - Gas	97	SI to API	m\xb3	scf	0.02831685	0
Volume - Gas	97	MIXED to API	scf	scf	1	0
Volume - Gas	97	DEX API Export	scf	scf	1	0
Volume - Gas	97	API to SI	scf	m\xb3	35.31466247	0
Volume - Gas	97	API to API	scf	scf	1	0
Density	96	SI to SI	kg/m\xb3	kg/m\xb3	1	0
Density	96	SI to API	kg/m\xb3	pp/1000gal	119826.4	0
Density	96	MIXED to API	pp/1000gal	pp/1000gal	1	0
Density	96	DEX API Export	pp/1000gal	pp/1000gal	1	0
Density	96	API to SI	pp/1000gal	kg/m\xb3	8.345404	0
Density	96	API to API	pp/1000gal	pp/1000gal	1	0
Ratio - Gas Liquid	95	SI to SI	Km\xb3/m\xb3	Km\xb3/m\xb3	1	0
Ratio - Gas Liquid	95	SI to API	Km\xb3/m\xb3	Mcf/bbl	0.1801175	0
Ratio - Gas Liquid	95	MIXED to API	Mcf/bbl	Mcf/bbl	1	0
Ratio - Gas Liquid	95	DEX API Export	Mcf/bbl	Mcf/bbl	1	0
Ratio - Gas Liquid	95	API to SI	Mcf/bbl	Km\xb3/m\xb3	5.551931378	0
Ratio - Gas Liquid	95	API to API	Mcf/bbl	Mcf/bbl	1	0
Volume	94	SI to SI	Km\xb3	Km\xb3	1	0
Volume	94	SI to API	Km\xb3	Mcf	0.02831685	0
Volume	94	MIXED to API	Mcf	Mcf	1	0
Volume	94	DEX API Export	Mcf	Mcf	1	0
Volume	94	API to SI	Mcf	Km\xb3	35.31466247	0
Volume	94	API to API	Mcf	Mcf	1	0
Yield Cement	93	SI to SI	m\xb3/sk	m\xb3/sk	1	0
Yield Cement	93	SI to API	m\xb3/sk	ft\xb3/sk	0.02831685	0
Yield Cement	93	MIXED to API	ft\xb3/sk	ft\xb3/sk	1	0
Yield Cement	93	DEX API Export	ft\xb3/sk	ft\xb3/sk	1	0
Yield Cement	93	API to SI	ft\xb3/sk	m\xb3/sk	35.31466247	0
Yield Cement	93	API to API	ft\xb3/sk	ft\xb3/sk	1	0
Power - HHP	92	SI to SI	kW/cm\xb2	kW/mm\xb2	100	0
Power - HHP	92	SI to API	kW/cm\xb2	HHP/in\xb2	0.1156369	0
Power - HHP	92	MIXED to API	HHP/in\xb2	HHP/in\xb2	1	0
Power - HHP	92	DEX API Export	HHP/in\xb2	HHP/in\xb2	1	0
Power - HHP	92	API to SI	HHP/in\xb2	kW/mm\xb2	864.7758907	0
Power - HHP	92	API to API	HHP/in\xb2	HHP/in\xb2	1	0
Diameter / Thickness	91	SI to SI	mm	mm	1	0
Diameter / Thickness	91	SI to API	mm	in	25.4	0
Diameter / Thickness	91	MIXED to API	/32"	in	32	0
Diameter / Thickness	91	DEX API Export	in	in	1	0
Diameter / Thickness	91	API to SI	/32"	mm	1.25984252	0
Diameter / Thickness	91	API to API	/32"	in	32	0
Pressure - Density Equivalent	90	SI to SI	kg/m\xb3	kg/m\xb3	1	0
Pressure - Density Equivalent	90	SI to API	kg/m\xb3	ppge	119.8264	0
Pressure - Density Equivalent	90	MIXED to API	ppge	ppge	1	0
Pressure - Density Equivalent	90	DEX API Export	ppge	ppge	1	0
Pressure - Density Equivalent	90	API to SI	ppge	kg/m\xb3	0.008345406	0
Pressure - Density Equivalent	90	API to API	ppge	ppge	1	0
Plastic Viscosity	89	SI to SI	mPa*s	mPa*s	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Plastic Viscosity	89	SI to API	mPa*s	cp	1	0
Plastic Viscosity	89	MIXED to API	cp	cp	1	0
Plastic Viscosity	89	DEX API Export	cp	cp	1	0
Plastic Viscosity	89	API to SI	cp	mPa*s	1	0
Plastic Viscosity	89	API to API	cp	cp	1	0
Volume	88	SI to SI	m\xb3	m\xb3	1	0
Volume	88	SI to API	m\xb3	gal	264.172037	0
Volume	88	MIXED to API	gal	gal	1	0
Volume	88	DEX API Export	gal	gal	1	0
Volume	88	API to SI	gal	m\xb3	0.003785412	0
Volume	88	API to API	gal	gal	1	0
Yield Point (Gel Strength)	87	SI to SI	Pa	Pa	1	0
Yield Point (Gel Strength)	87	SI to API	Pa	lb/100ft\xb2	0.4788026	0
Yield Point (Gel Strength)	87	MIXED to API	lb/100ft\xb2	lb/100ft\xb2	1	0
Yield Point (Gel Strength)	87	DEX API Export	lb/100ft\xb2	lb/100ft\xb2	1	0
Yield Point (Gel Strength)	87	API to SI	lb/100ft\xb2	Pa	2.088543379	0
Yield Point (Gel Strength)	87	API to API	lb/100ft\xb2	lb/100ft\xb2	1	0
Walk Rate	86	SI to SI	m/30m	m/30m	1	0
Walk Rate	86	SI to API	m/30m	ft/100ft	0.3048	0
Walk Rate	86	MIXED to API	ft/100ft	ft/100ft	1	0
Walk Rate	86	DEX API Export	ft/100ft	ft/100ft	1	0
Walk Rate	86	API to SI	ft/100ft	m/30m	3.280839895	0
Walk Rate	86	API to API	ft/100ft	ft/100ft	1	0
Volume	85	SI to SI	SCM	SCM	1	0
Volume	85	SI to API	SCM	MCF	0.02831685	0
Volume	85	MIXED to API	MCF	MCF	1	0
Volume	85	DEX API Export	MCF	MCF	1	0
Volume	85	API to SI	MCF	SCM	35.31466247	0
Volume	85	API to API	MCF	MCF	1	0
Volume	84	SI to SI	m\xb3	m\xb3	1	0
Volume	84	SI to API	m\xb3	bbl	0.158987	0
Volume	84	MIXED to API	bbl	bbl	1	0
Volume	84	DEX API Export	bbl	bbl	1	0
Volume	84	API to SI	bbl	m\xb3	6.28981057	0
Volume	84	API to API	bbl	bbl	1	0
Volume	83	SI to SI	cm\xb3	cm\xb3	1	0
Volume	83	SI to API	cm\xb3	ft\xb3	28316.85	0
Volume	83	MIXED to API	ft\xb3	ft\xb3	1	0
Volume	83	DEX API Export	ft\xb3	ft\xb3	1	0
Volume	83	API to SI	ft\xb3	cm\xb3	0.000035314	0
Volume	83	API to API	ft\xb3	ft\xb3	1	0
Volume	82	SI to SI	m\xb3	m\xb3	1	0
Volume	82	SI to API	m\xb3	bbl	0.158987	0
Volume	82	MIXED to API	bbl	bbl	1	0
Volume	82	DEX API Export	bbl	bbl	1	0
Volume	82	API to SI	bbl	m\xb3	6.28981057	0
Volume	82	API to API	bbl	bbl	1	0
Volume	81	SI to SI	m\xb3	m\xb3	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Volume	81	SI to API	m\xb3	bbl	0.158987	0
Volume	81	MIXED to API	bbl	bbl	1	0
Volume	81	DEX API Export	gal	bbl	0.02380952380952	0
Volume	81	API to SI	bbl	m\xb3	6.28981057	0
Volume	81	API to API	bbl	bbl	1	0
Volume	80	SI to SI	m\xb3	m\xb3	1	0
Volume	80	SI to API	m\xb3	ft\xb3	0.02831685	0
Volume	80	MIXED to API	ft\xb3	ft\xb3	1	0
Volume	80	DEX API Export	ft\xb3	ft\xb3	1	0
Volume	80	API to SI	ft\xb3	m\xb3	35.31466247	0
Volume	80	API to API	ft\xb3	ft\xb3	1	0
Volume	79	SI to SI	m\xb3	m\xb3	1	0
Volume	79	SI to API	m\xb3	bbl	0.158987	0
Volume	79	MIXED to API	bbl	bbl	1	0
Volume	79	DEX API Export	bbl	bbl	1	0
Volume	79	API to SI	bbl	m\xb3	6.28981057	0
Volume	79	API to API	bbl	bbl	1	0
Volume	78	SI to SI	mL	mL	1	0
Volume	78	SI to API	mL	cc	1	0
Volume	78	MIXED to API	cc	cc	1	0
Volume	78	DEX API Export	cc	cc	1	0
Volume	78	API to SI	cc	mL	1	0
Volume	78	API to API	cc	cc	1	0
Voltage (Electric Stability)	77	SI to SI	mV	mV	1	0
Voltage (Electric Stability)	77	SI to API	mV	mV	1	0
Voltage (Electric Stability)	77	MIXED to API	mV	mV	1	0
Voltage (Electric Stability)	77	DEX API Export	mV	mV	1	0
Voltage (Electric Stability)	77	API to SI	mV	mV	1	0
Voltage (Electric Stability)	77	API to API	mV	mV	1	0
Voltage	76	SI to SI	V	V	1	0
Voltage	76	SI to API	V	V	1	0
Voltage	76	MIXED to API	V	V	1	0
Voltage	76	DEX API Export	V	V	1	0
Voltage	76	API to SI	V	V	1	0
Voltage	76	API to API	V	V	1	0
Viscosity	75	SI to SI	s/l	s/l	1	0
Viscosity	75	SI to API	s/l	s/qt	1.0566882	0
Viscosity	75	MIXED to API	s/qt	s/qt	1	0
Viscosity	75	DEX API Export	s/qt	s/qt	1	0
Viscosity	75	API to SI	s/qt	s/l	0.94635295	0
Viscosity	75	API to API	s/qt	s/qt	1	0
Velocity - Seconds	74	SI to SI	m/s	m/s	1	0
Velocity - Seconds	74	SI to API	m/s	ft/s	0.3048	0
Velocity - Seconds	74	MIXED to API	ft/s	ft/s	1	0
Velocity - Seconds	74	DEX API Export	ft/s	ft/s	1	0
Velocity - Seconds	74	API to SI	ft/s	m/s	3.280839895	0
Velocity - Seconds	74	API to API	ft/s	ft/s	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Velocity - Nautical	73	SI to SI	Knts	Knts	1	0
Velocity - Nautical	73	SI to API	Knts	Knts	1	0
Velocity - Nautical	73	MIXED to API	Knts	Knts	1	0
Velocity - Nautical	73	DEX API Export	Knts	Knts	1	0
Velocity - Nautical	73	API to SI	Knts	Knts	1	0
Velocity - Nautical	73	API to API	Knts	Knts	1	0
Velocity - Minutes	72	SI to SI	m/min	m/min	1	0
Velocity - Minutes	72	SI to API	m/min	ft/min	0.3048	0
Velocity - Minutes	72	MIXED to API	ft/min	ft/min	1	0
Velocity - Minutes	72	DEX API Export	ft/min	ft/min	1	0
Velocity - Minutes	72	API to SI	ft/min	m/min	3.280839895	0
Velocity - Minutes	72	API to API	ft/min	ft/min	1	0
Velocity - Hours / (R.O.P.)	71	SI to SI	m/hr	m/hr	1	0
Velocity - Hours / (R.O.P.)	71	SI to API	m/hr	ft/hr	0.3048	0
Velocity - Hours / (R.O.P.)	71	MIXED to API	ft/hr	ft/hr	1	0
Velocity - Hours / (R.O.P.)	71	DEX API Export	ft/hr	ft/hr	1	0
Velocity - Hours / (R.O.P.)	71	API to SI	ft/hr	m/hr	3.280839895	0
Velocity - Hours / (R.O.P.)	71	API to API	ft/hr	ft/hr	1	0
Torque	70	SI to SI	N-m	N-m	1	0
Torque	70	SI to API	N-m	ft-lbf	1.3558	0
Torque	70	MIXED to API	ft-lbf	ft-lbf	1	0
Torque	70	DEX API Export	ft-lbf	ft-lbf	1	0
Torque	70	API to SI	ft-lbf	N-m	0.73756212	0
Torque	70	API to API	ft-lbf	ft-lbf	1	0
Time Period - Seconds	69	SI to SI	s	s	1	0
Time Period - Seconds	69	SI to API	s	s	1	0
Time Period - Seconds	69	MIXED to API	s	s	1	0
Time Period - Seconds	69	DEX API Export	s	s	1	0
Time Period - Seconds	69	API to SI	s	s	1	0
Time Period - Seconds	69	API to API	s	s	1	0
Time Period - Minutes	68	SI to SI	min	min	1	0
Time Period - Minutes	68	SI to API	min	min	1	0
Time Period - Minutes	68	MIXED to API	min	min	1	0
Time Period - Minutes	68	DEX API Export	min	min	1	0
Time Period - Minutes	68	API to SI	min	min	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Time Period - Minutes	68	API to API	min	min	1	0
Time Period - Hours	67	SI to SI	hr	hr	1	0
Time Period - Hours	67	SI to API	hr	hr	1	0
Time Period - Hours	67	MIXED to API	hr	hr	1	0
Time Period - Hours	67	DEX API Export	hr	hr	1	0
Time Period - Hours	67	API to SI	hr	hr	1	0
Time Period - Hours	67	API to API	hr	hr	1	0
Time Period - Days	66	SI to SI	days	days	1	0
Time Period - Days	66	SI to API	days	days	1	0
Time Period - Days	66	MIXED to API	days	days	1	0
Time Period - Days	66	DEX API Export	days	days	1	0
Time Period - Days	66	API to SI	days	days	1	0
Time Period - Days	66	API to API	days	days	1	0
Temperature	65	SI to SI	\xb0C	\xb0C	1	0
Temperature	65	SI to API	\xb0C	\xb0F	0.555556	-17.777778
Temperature	65	MIXED to API	\xb0F	\xb0F	1	0
Temperature	65	DEX API Export	\xb0F	\xb0F	1	0
Temperature	65	API to SI	\xb0F	\xb0C	1.8	32
Temperature	65	API to API	\xb0F	\xb0F	1	0
Temperature	64	SI to SI	\xb0C	\xb0C	1	0
Temperature	64	SI to API	\xb0C	\xb0F	0.555556	-17.777778
Temperature	64	MIXED to API	\xb0F	\xb0F	1	0
Temperature	64	DEX API Export	\xb0F	\xb0F	1	0
Temperature	64	API to SI	\xb0F	\xb0C	1.8	32
Temperature	64	API to API	\xb0F	\xb0F	1	0
Ratio - Water Oil	63	SI to SI	m\xb3/m\xb3	m\xb3/m\xb3	1	0
Ratio - Water Oil	63	SI to API	m\xb3/m\xb3	bbl/bbl	1	0
Ratio - Water Oil	63	MIXED to API	bbl/bbl	bbl/bbl	1	0
Ratio - Water Oil	63	DEX API Export	bbl/bbl	bbl/bbl	1	0
Ratio - Water Oil	63	API to SI	bbl/bbl	m\xb3/m\xb3	1	0
Ratio - Water Oil	63	API to API	bbl/bbl	bbl/bbl	1	0
Ratio - Gas Oil	62	SI to SI	m\xb3/m\xb3	m\xb3/m\xb3	1	0
Ratio - Gas Oil	62	SI to API	m\xb3/m\xb3	scf/bbl	0.1801175	0
Ratio - Gas Oil	62	MIXED to API	scf/bbl	scf/bbl	1	0
Ratio - Gas Oil	62	DEX API Export	scf/bbl	scf/bbl	1	0
Ratio - Gas Oil	62	API to SI	scf/bbl	m\xb3/m\xb3	5.551931378	0
Ratio - Gas Oil	62	API to API	scf/bbl	scf/bbl	1	0
Pressure Gradient	61	SI to SI	kg/m3	kg/m3	1	0
Pressure Gradient	61	SI to API	kg/m3	lbf/bbl	0.350015	0
Pressure Gradient	61	MIXED to API	lbf/bbl	lbf/bbl	1	0
Pressure Gradient	61	DEX API Export	lbf/bbl	lbf/bbl	1	0
Pressure Gradient	61	API to SI	lbf/bbl	kg/m3	0.35056987	0
Pressure Gradient	61	API to API	lbf/bbl	lbf/bbl	1	0
Pressure	60	SI to SI	kPa	kPa	1	0
Pressure	60	SI to API	kPa	psi	6.894757	0
Pressure	60	MIXED to API	psi	psi	1	0
Pressure	60	DEX API Export	psi	psi	1	0
Pressure	60	API to SI	psi	kPa	0.145037744	0
Pressure	60	API to API	psi	psi	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Power	59	SI to SI	kW	kW	1	0
Power	59	SI to API	kW	hp	0.7456999	0
Power	59	MIXED to API	hp	hp	1	0
Power	59	DEX API Export	hp	hp	1	0
Power	59	API to SI	hp	kW	1.340482574	0
Power	59	API to API	hp	hp	1	0
Permeability	58	SI to SI	\xb5m\xb2	\xb5m\xb2	1	0
Permeability	58	SI to API	\xb5m\xb2	mD	9.8692329983261E-04	0
Permeability	58	MIXED to API	mD	mD	1	0
Permeability	58	DEX API Export	mD	mD	1	0
Permeability	58	API to SI	mD	\xb5m\xb2	1013.249966	0
Permeability	58	API to API	mD	mD	1	0
Permeability	57	SI to SI	\xb5m\xb2	\xb5m\xb2	1	0
Permeability	57	SI to API	\xb5m\xb2	darcy	0.98692329983261	0
Permeability	57	MIXED to API	darcy	darcy	1	0
Permeability	57	DEX API Export	darcy	darcy	1	0
Permeability	57	API to SI	darcy	\xb5m\xb2	1.013249966	0
Permeability	57	API to API	darcy	darcy	1	0
Percentage	56	SI to SI	%	%	1	0
Percentage	56	SI to API	%	%	1	0
Percentage	56	MIXED to API	%	%	1	0
Percentage	56	DEX API Export	%	%	1	0
Percentage	56	API to SI	%	%	1	0
Percentage	56	API to API	%	%	1	0
Percentage	55	SI to SI	%	%	1	0
Percentage	55	SI to API	%	%	1	0
Percentage	55	MIXED to API	%	%	1	0
Percentage	55	DEX API Export	%	%	1	0
Percentage	55	API to SI	%	%	1	0
Percentage	55	API to API	%	%	1	0
Percentage	54	SI to SI	%	%	1	0
Percentage	54	SI to API	%	%	1	0
Percentage	54	MIXED to API	%	%	1	0
Percentage	54	DEX API Export	%	%	1	0
Percentage	54	API to SI	%	%	1	0
Percentage	54	API to API	%	%	1	0
Mass per unit of Length	53	SI to SI	kg/m	kg/m	1	0
Mass per unit of Length	53	SI to API	kg/m	lb/ft	1.488164	0
Mass per unit of Length	53	MIXED to API	lb/ft	lb/ft	1	0
Mass per unit of Length	53	DEX API Export	lb/ft	lb/ft	1	0
Mass per unit of Length	53	API to SI	lb/ft	kg/m	0.67196897	0
Mass per unit of Length	53	API to API	lb/ft	lb/ft	1	0
Mass	52	SI to SI	kg	kg	1	0
Mass	52	SI to API	kg	Klb	453.592	0
Mass	52	MIXED to API	Klb	Klb	1	0
Mass	52	DEX API Export	Klb	Klb	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Mass	52	API to SI	Klb	kg	0.00220462	0
Mass	52	API to API	Klb	Klb	1	0
Mass	51	SI to SI	tonne	tonne	1	0
Mass	51	SI to API	tonne	ton	0.9071847	0
Mass	51	MIXED to API	ton	ton	1	0
Mass	51	DEX API Export	ton	ton	1	0
Mass	51	API to SI	ton	tonne	1.10231136	0
Mass	51	API to API	ton	ton	1	0
Mass	50	SI to SI	tonne	tonne	1	0
Mass	50	SI to API	tonne	Mlbs	0.453592	0
Mass	50	MIXED to API	Mlbs	Mlbs	1	0
Mass	50	DEX API Export	Mlbs	Mlbs	1	0
Mass	50	API to SI	Mlbs	tonne	2.2046226	0
Mass	50	API to API	Mlbs	Mlbs	1	0
Mass	49	SI to SI	kg	kg	1	0
Mass	49	SI to API	kg	lb	0.453592	0
Mass	49	MIXED to API	lb	lb	1	0
Mass	49	DEX API Export	lb	lb	1	0
Mass	49	API to SI	lb	kg	2.2046226	0
Mass	49	API to API	lb	lb	1	0
Length	48	SI to SI	cm	cm	1	0
Length	48	SI to API	cm	in	2.54	0
Length	48	MIXED to API	in	in	1	0
Length	48	DEX API Export	in	in	1	0
Length	48	API to SI	in	cm	0.393700787	0
Length	48	API to API	in	in	1	0
Length	47	SI to SI	m	m	1	0
Length	47	SI to API	m	ft	0.3048	0
Length	47	MIXED to API	ft	ft	1	0
Length	47	DEX API Export	ft	ft	1	0
Length	47	API to SI	ft	m	3.280839895	0
Length	47	API to API	ft	ft	1	0
Length	46	SI to SI	cm	cm	1	0
Length	46	SI to API	cm	in	2.54	0
Length	46	MIXED to API	in	in	1	0
Length	46	DEX API Export	in	ft	12	0
Length	46	API to SI	in	cm	0.393700787	0
Length	46	API to API	in	in	1	0
Length	45	SI to SI	m	m	1	0
Length	45	SI to API	m	ft	0.3048	0
Length	45	MIXED to API	ft	ft	1	0
Length	45	DEX API Export	ft	ft	1	0
Length	45	API to SI	ft	m	3.280839895	0
Length	45	API to API	ft	ft	1	0
Length	44	SI to SI	micron	\xb5m	1	0
Length	44	SI to API	\xb5m	micron	1	0
Length	44	MIXED to API	micron	micron	1	0
Length	44	DEX API Export	micron	micron	1	0
Length	44	API to SI	micron	\xb5m	1	0
Length	44	API to API	micron	micron	1	0
Length	43	SI to SI	m	m	1	0
Length	43	SI to API	m	ft	0.3048	0
Length	43	MIXED to API	ft	ft	1	0
Length	43	DEX API Export	ft	ft	1	0
Length	43	API to SI	ft	m	3.280839895	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Length	43	API to API	ft	ft	1	0
Frequency - Rotational	42	SI to SI	rpm	rpm	1	0
Frequency - Rotational	42	SI to API	rpm	rpm	1	0
Frequency - Rotational	42	MIXED to API	rpm	rpm	1	0
Frequency - Rotational	42	DEX API Export	rpm	rpm	1	0
Frequency - Rotational	42	API to SI	rpm	rpm	1	0
Frequency - Rotational	42	API to API	rpm	rpm	1	0
Frequency - Linear	41	SI to SI	spm	spm	1	0
Frequency - Linear	41	SI to API	spm	spm	1	0
Frequency - Linear	41	MIXED to API	spm	spm	1	0
Frequency - Linear	41	DEX API Export	spm	spm	1	0
Frequency - Linear	41	API to SI	spm	spm	1	0
Frequency - Linear	41	API to API	spm	spm	1	0
Force	40	SI to SI	kg	kg	1	0
Force	40	SI to API	kg	kip	453.5925	0
Force	40	MIXED to API	kip	kip	1	0
Force	40	DEX API Export	kip	kip	1	0
Force	40	API to SI	kip	kg	0.0022046	0
Force	40	API to API	kip	kip	1	0
Force	39	SI to SI	daN	daN	1	0
Force	39	SI to API	daN	lb	0.444822	0
Force	39	MIXED to API	lb	lb	1	0
Force	39	DEX API Export	lb	lb	1	0
Force	39	API to SI	lb	daN	2.24808924	0
Force	39	API to API	lb	lb	1	0
Fluid Loss	38	SI to SI	mL	mL	1	0
Fluid Loss	38	SI to API	mL	mL	1	0
Fluid Loss	38	MIXED to API	mL	mL	1	0
Fluid Loss	38	DEX API Export	mL	mL	1	0
Fluid Loss	38	API to SI	mL	mL	1	0
Fluid Loss	38	API to API	mL	mL	1	0
Fluid Loss	37	SI to SI	cc/30min	cc/30min	1	0
Fluid Loss	37	SI to API	cc/30min	cc/30min	1	0
Fluid Loss	37	MIXED to API	cc/30min	cc/30min	1	0
Fluid Loss	37	DEX API Export	cc/30min	cc/30min	1	0
Fluid Loss	37	API to SI	cc/30min	cc/30min	1	0
Fluid Loss	37	API to API	cc/30min	cc/30min	1	0
Flow Rate	36	SI to SI	m\xb3/day	m\xb3/day	1	0
Flow Rate	36	SI to API	m\xb3/day	bbl/day	0.1589873	0
Flow Rate	36	MIXED to API	bbl/day	bbl/day	1	0
Flow Rate	36	DEX API Export	bbl/day	bbl/day	1	0
Flow Rate	36	API to SI	bbl/day	m\xb3/day	6.28981057	0
Flow Rate	36	API to API	bbl/day	bbl/day	1	0
Flow Rate	35	SI to SI	m\xb3/min	m\xb3/min	1	0
Flow Rate	35	SI to API	m\xb3/min	bbl/min	0.1589873	0
Flow Rate	35	MIXED to API	bbl/min	bbl/min	1	0
Flow Rate	35	DEX API Export	gal/min	bbl/min	0.02380952380952	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Flow Rate	35	API to SI	bbl/min	m\xb3/min	6.28981057	0
Flow Rate	35	API to API	bbl/min	bbl/min	1	0
Flow Rate	34	SI to SI	MCM/day	MCM/day	1	0
Flow Rate	34	SI to API	MCM/day	MCF/day	0.02831685	0
Flow Rate	34	MIXED to API	MCF/day	MCF/day	1	0
Flow Rate	34	DEX API Export	MCF/day	MCF/day	1	0
Flow Rate	34	API to SI	MCF/day	MCM/day	35.31466247	0
Flow Rate	34	API to API	MCF/day	MCF/day	1	0
Flow Rate	33	SI to SI	m\xb3/hr	m\xb3/hr	1	0
Flow Rate	33	SI to API	m\xb3/hr	bbl/hr	0.1589873	0
Flow Rate	33	MIXED to API	bbl/hr	bbl/hr	1	0
Flow Rate	33	DEX API Export	bbl/hr	bbl/hr	1	0
Flow Rate	33	API to SI	bbl/hr	m\xb3/hr	6.28981057	0
Flow Rate	33	API to API	bbl/hr	bbl/hr	1	0
Flow Rate	32	SI to SI	m\xb3/min	m\xb3/min	1	0
Flow Rate	32	SI to API	m\xb3/min	gpm	0.003785412	0
Flow Rate	32	MIXED to API	gpm	gpm	1	0
Flow Rate	32	DEX API Export	gpm	gpm	1	0
Flow Rate	32	API to SI	gpm	m\xb3/min	264.1720351	0
Flow Rate	32	API to API	gpm	gpm	1	0
Flow Rate	31	SI to SI	m\xb3/day	m\xb3/day	1	0
Flow Rate	31	SI to API	m\xb3/day	MCF/Day	0.02831685	0
Flow Rate	31	MIXED to API	MCF/day	MCF/day	1	0
Flow Rate	31	DEX API Export	MCF/day	MCF/day	1	0
Flow Rate	31	API to SI	MCF/day	m\xb3/day	0.03531466	0
Flow Rate	31	API to API	MCF/day	MCF/day	1	0
Flow Rate	30	SI to SI	m\xb3/day	m\xb3/day	1	0
Flow Rate	30	SI to API	m\xb3/day	bbl/day	0.1589873	0
Flow Rate	30	MIXED to API	bbl/day	bbl/day	1	0
Flow Rate	30	DEX API Export	bbl/day	bbl/day	1	0
Flow Rate	30	API to SI	bbl/day	m\xb3/day	6.28981057	0
Flow Rate	30	API to API	bbl/day	bbl/day	1	0
Flow Rate	29	SI to SI	m\xb3/min	m\xb3/min	1	0
Flow Rate	29	SI to API	m\xb3/min	bbl/min	0.1589873	0
Flow Rate	29	MIXED to API	bbl/min	bbl/min	1	0
Flow Rate	29	DEX API Export	bbl/min	bbl/min	1	0
Flow Rate	29	API to SI	bbl/min	m\xb3/min	6.28981057	0
Flow Rate	29	API to API	bbl/min	bbl/min	1	0
Flow Rate	28	SI to SI	L/min	l/min	1	0
Flow Rate	28	SI to API	L/min	gpm	3.785412	0
Flow Rate	28	MIXED to API	gpm	gpm	1	0
Flow Rate	28	DEX API Export	gpm	gpm	1	0
Flow Rate	28	API to SI	gpm	l/min	0.264172035	0
Flow Rate	28	API to API	gpm	gpm	1	0
Electric Current	27	SI to SI	amps	amps	1	0
Electric Current	27	SI to API	amps	amps	1	0
Electric Current	27	MIXED to API	amps	amps	1	0
Electric Current	27	DEX API Export	amps	amps	1	0
Electric Current	27	API to SI	amps	amps	1	0
Electric Current	27	API to API	amps	amps	1	0
Distance - Nautical Miles	26	SI to SI	nM	nM	1	0
Distance - Nautical Miles	26	SI to API	nM	nM	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Distance - Nautical Miles	26	MIXED to API	nM	nM	1	0
Distance - Nautical Miles	26	DEX API Export	nM	nM	1	0
Distance - Nautical Miles	26	API to SI	nM	nM	1	0
Distance - Nautical Miles	26	API to API	nM	nM	1	0
Distance	25	SI to SI	m	m	1	0
Distance	25	SI to API	m	ft	0.3048	0
Distance	25	MIXED to API	ft	ft	1	0
Distance	25	DEX API Export	ft	ft	1	0
Distance	25	API to SI	ft	m	3.280839895	0
Distance	25	API to API	ft	ft	1	0
Distance	24	SI to SI	m	m	1	0
Distance	24	SI to API	m	ft	0.3048	0
Distance	24	MIXED to API	ft	ft	1	0
Distance	24	DEX API Export	ft	ft	1	0
Distance	24	API to SI	ft	m	3.280839895	0
Distance	24	API to API	ft	ft	1	0
Displacement	23	SI to SI	m\xb3/m	m\xb3/m	1	0
Displacement	23	SI to API	m\xb3/m	bbl/ft	0.5126118	0
Displacement	23	MIXED to API	bbl/ft	bbl/ft	1	0
Displacement	23	DEX API Export	ft\xb3\ft	bbl/ft	0.1781075952	0
Displacement	23	API to SI	bbl/ft	m\xb3/m	1.9171342	0
Displacement	23	API to API	bbl/ft	bbl/ft	1	0
Direction/Bearing	22	SI to SI	\xb0	\xb0	1	0
Direction/Bearing	22	SI to API	\xb0	\xb0	1	0
Direction/Bearing	22	MIXED to API	\xb0	\xb0	1	0
Direction/Bearing	22	DEX API Export	\xb0	\xb0	1	0
Direction/Bearing	22	API to SI	\xb0	\xb0	1	0
Direction/Bearing	22	API to API	\xb0	\xb0	1	0
Direction/Bearing	21	SI to SI	\xb0	\xb0	1	0
Direction/Bearing	21	SI to API	\xb0	\xb0	1	0
Direction/Bearing	21	MIXED to API	\xb0	\xb0	1	0
Direction/Bearing	21	DEX API Export	\xb0	\xb0	1	0
Direction/Bearing	21	API to SI	\xb0	\xb0	1	0
Direction/Bearing	21	API to API	\xb0	\xb0	1	0
Diameter / Thickness	20	SI to SI	mm	mm	1	0
Diameter / Thickness	20	SI to API	mm	/32"	0.79375	0
Diameter / Thickness	20	MIXED to API	/32"	/32"	1	0
Diameter / Thickness	20	DEX API Export	/32""	/32""	1	0
Diameter / Thickness	20	API to SI	/32"	mm	1.25984252	0
Diameter / Thickness	20	API to API	/32"	/32"	1	0
Diameter	19	SI to SI	cm	cm	1	0
Diameter	19	SI to API	cm	in	2.54	0
Diameter	19	MIXED to API	in	in	1	0
Diameter	19	DEX API Export	in	in	1	0
Diameter	19	API to SI	in	cm	0.393700787	0
Diameter	19	API to API	in	in	1	0
Diameter	18	SI to SI	mm	mm	1	0
Diameter	18	SI to API	mm	in	25.4	0
Diameter	18	MIXED to API	in	in	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Diameter	18	DEX API Export	in	in	1	0
Diameter	18	API to SI	in	mm	0.0393700787	0
Diameter	18	API to API	in	in	1	0
Diameter	17	SI to SI	mm	mm	1	0
Diameter	17	SI to API	mm	in	25.4	0
Diameter	17	MIXED to API	in	in	1	0
Diameter	17	DEX API Export	in	in	1	0
Diameter	17	API to SI	in	mm	0.0393700787	0
Diameter	17	API to API	in	in	1	0
Diameter	16	SI to SI	mm	mm	1	0
Diameter	16	SI to API	mm	/64"	0.039687	0
Diameter	16	MIXED to API	/64"	/64"	1	0
Diameter	16	DEX API Export	/64""	/64""	1	0
Diameter	16	API to SI	/64"	mm	2.519685	0
Diameter	16	API to API	/64"	/64"	1	0
Diameter	15	SI to SI	mm	mm	1	0
Diameter	15	SI to API	mm	in	25.4	0
Diameter	15	MIXED to API	in	in	1	0
Diameter	15	DEX API Export	in	in	1	0
Diameter	15	API to SI	in	mm	0.0393700787	0
Diameter	15	API to API	in	in	1	0
Depth	14	SI to SI	m	m	1	0
Depth	14	SI to API	m	ft	0.3048	0
Depth	14	MIXED to API	ft	ft	1	0
Depth	14	DEX API Export	ft	ft	1	0
Depth	14	API to SI	ft	m	3.280839895	0
Depth	14	API to API	ft	ft	1	0
Depth	13	SI to SI	m	m	1	0
Depth	13	SI to API	m	ft	0.3048	0
Depth	13	MIXED to API	ft	ft	1	0
Depth	13	DEX API Export	ft	ft	1	0
Depth	13	API to SI	ft	m	3.280839895	0
Depth	13	API to API	ft	ft	1	0
Density - SP. Gr.	12	SI to SI			1	0
Density - SP. Gr.	12	SI to API			1	0
Density - SP. Gr.	12	MIXED to API			1	0
Density - SP. Gr.	12	DEX API Export			1	0
Density - SP. Gr.	12	API to SI			1	0
Density - SP. Gr.	12	API to API			1	0
Density	11	SI to SI	mg/L	mg/L	1	0
Density	11	SI to API	mg/L	ppg	0.1198264	0
Density	11	MIXED to API	ppg	ppg	1	0
Density	11	DEX API Export	ppg	ppg	1	0
Density	11	API to SI	ppg	mg/L	0.000008345404	0
Density	11	API to API	ppg	ppg	1	0
Density	10	SI to SI	kg/m\xb3	kg/m\xb3	1	0
Density	10	SI to API	kg/m\xb3	ppg	119.8264	0
Density	10	MIXED to API	ppg	ppg	1	0
Density	10	DEX API Export	ppg	ppg	1	0
Density	10	API to SI	ppg	kg/m\xb3	0.008345404	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Density	10	API to API	ppg	ppg	1	0
D.L.S./B.U.R.	9	SI to SI	\xb0/30m	\xb0/30m	1	0
D.L.S./B.U.R.	9	SI to API	\xb0/30 m	\xb0/100ft	0.98425197	0
D.L.S./B.U.R.	9	MIXED to API	\xb0/100ft	\xb0/100ft	1	0
D.L.S./B.U.R.	9	DEX API Export	\xb0/100ft	\xb0/100ft	1	0
D.L.S./B.U.R.	9	API to SI	\xb0/100ft	\xb0/30 m	1.016	0
D.L.S./B.U.R.	9	API to API	\xb0/100ft	\xb0/100ft	1	0
Concentration	8	SI to SI	ppm	ppm	1	0
Concentration	8	SI to API	ppm	ppm	1	0
Concentration	8	MIXED to API	ppm	ppm	1	0
Concentration	8	DEX API Export	ppm	ppm	1	0
Concentration	8	API to SI	ppm	ppm	1	0
Concentration	8	API to API	ppm	ppm	1	0
Concentration	7	SI to SI	ppb	ppb	1	0
Concentration	7	SI to API	ppb	ppb	1	0
Concentration	7	MIXED to API	ppb	ppb	1	0
Concentration	7	DEX API Export	ppb	ppb	1	0
Concentration	7	API to SI	ppb	ppb	1	0
Concentration	7	API to API	ppb	ppb	1	0
Concentration	6	SI to SI	mg/L	mg/L	1	0
Concentration	6	SI to API	mg/L	ppm	1	0
Concentration	6	MIXED to API	ppm	ppm	1	0
Concentration	6	DEX API Export	ppm	ppm	1	0
Concentration	6	API to SI	ppm	mg/L	1	0
Concentration	6	API to API	ppm	ppm	1	0
Area	5	SI to SI	mm\xb2	mm\xb2	1	0
Area	5	SI to API	mm\xb2	in\xb2	645.16	0
Area	5	MIXED to API	in\xb2	in\xb2	1	0
Area	5	DEX API Export	in\xb2	in\xb2	1	0
Area	5	API to SI	in\xb2	mm\xb2	0.0015500031	0
Area	5	API to API	in\xb2	in\xb2	1	0
Angle	4	SI to SI	\xb0	\xb0	1	0
Angle	4	SI to API	\xb0	\xb0	1	0
Angle	4	MIXED to API	\xb0	\xb0	1	0
Angle	4	DEX API Export	\xb0	\xb0	1	0
Angle	4	API to SI	\xb0	\xb0	1	0
Angle	4	API to API	\xb0	\xb0	1	0
Angle	3	SI to SI	\xb0	\xb0	1	0
Angle	3	SI to API	\xb0	\xb0	1	0
Angle	3	MIXED to API	\xb0	\xb0	1	0
Angle	3	DEX API Export	\xb0	\xb0	1	0
Angle	3	API to SI	\xb0	\xb0	1	0
Angle	3	API to API	\xb0	\xb0	1	0
Electric Current	2	SI to SI	amps	amps	1	0
Electric Current	2	SI to API	amps	amps	1	0
Electric Current	2	MIXED to API	amps	amps	1	0
Electric Current	2	DEX API Export	amps	amps	1	0
Electric Current	2	API to SI	amps	amps	1	0
Electric Current	2	API to API	amps	amps	1	0
Electric Current	1	SI to SI	amps	amps	1	0
Electric Current	1	SI to API	amps	amps	1	0
Electric Current	1	MIXED to API	amps	amps	1	0
Electric Current	1	DEX API Export	amps	amps	1	0
Electric Current	1	API to SI	amps	amps	1	0

FULL_DESC	UNIT_ TYPE	UNIT_SET	UNIT_DISP	UNIT_STORE	MULTI-PLIER	OFF-SET
Electric Current	1	API to API	amps	amps	1	0
Tubular Diameters	-1	SI to SI	mm	mm	1	0
Tubular Diameters	-1	SI to API	mm	in	1	0
Tubular Diameters	-1	MIXED to API	in	in	1	0
Tubular Diameters	-1	DEX API Export	in	in	1	0
Tubular Diameters	-1	API to SI	in	mm	1	0
Tubular Diameters	-1	API to API	in	in	1	0
Tubular Weights	-2	SI to SI	kg/m	kg/m	1	0
Tubular Weights	-2	SI to API	kg/m	lb/ft	1	0
Tubular Weights	-2	MIXED to API	lb/ft	lb/ft	1	0
Tubular Weights	-2	DEX API Export	lb/ft	lb/ft	1	0
Tubular Weights	-2	API to SI	lb/ft	kg/m	1	0
Tubular Weights	-2	API to API	lb/ft	lb/ft	1	0

UMS_SYS_UNIT_MEASURES Table

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_unitless	0	0		no units	1	0	0
MEASURE_1_day	1	1	1/day	one over days	0.000011574074	0	1
MEASURE_1_hr	2	1	1/hr	one over hours	0.00027777777778	0	1
MEASURE_1_min	3	1	1/min	one over minutes	0.016666666667	0	1
MEASURE_1_sec	4	1	1/sec	one over seconds	1	0	1
MEASURE_dollar_day	5	1	$/day	dollars per day	0.000011574074	0	1
MEASURE_dollar_hr	6	1	$/hr	dollars per hour	0.00027777777778	0	1
MEASURE_dollar_min	7	1	$/min	dollars per minute	0.016666666667	0	1
MEASURE_dollar_sec	8	1	$/s	dollars per second	1	0	1
MEASURE_1_bbl	9	2	1/bbl	one over barrels	0.178107595	0	1
MEASURE_1_m3	10	2	1/m³	one over cubic metres	0.028316846	0	1
MEASURE_1_ft3	11	2	1/ft³	one over cubic feet	1	0	1
MEASURE_amps	12	3	amps	amperes	1	0	1
MEASURE_rpm	13	4	rpm	revolutions per minute	1	0	1
MEASURE_rad_sec	14	4	rad/s	radians per second	9.549296586	0	1
MEASURE_rps	15	4	hertz	revolutions per second	60	0	1
MEASURE_deg	16	5	°	decimal degrees	1	0	1
MEASURE_rad	17	5	rad	radians	57.2957795130823	0	1
MEASURE_revs	18	5	revs	number of revolutions	360	0	1
MEASURE_rad_m	19	6	rad/m	radians per metre	1746.37536	0	1
MEASURE_r_100m	20	6	rad/100m	radians per 100 metres	17.4637536	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_d_100m	21	6	°/100m	degree per 100 metres	0.3048	0	1
MEASURE_d_10m	22	6	°/10m	degree per 10 metres	3.048	0	1
MEASURE_r_ft	23	6	rad/ft	radians per 1 foot	5729.577951	0	1
MEASURE_r_30m	24	6	rad/30m	radians per 30 metres	58.21251199	0	1
MEASURE_r_100ft	25	6	rad/100ft	radians per 100 feet	57.29577951	0	1
MEASURE_d_30m	26	6	°/30m	degree per 30 metres	1.016	0	1
MEASURE_d_100ft	27	6	°/100ft	degree per 100 feet	1	0	1
MEASURE_r_10m	28	6	rad/10m	radians per 10 metres	174.637536	0	1
MEASURE_in2	29	7	in²	square inches	1	0	1
MEASURE_ft2	30	7	ft²	square feet	144	0	1
MEASURE_cm2	31	7	cm²	square centimetres	0.1550003	0	1
MEASURE_m2	32	7	m²	square metres	1550.003	0	1
MEASURE_mm2	33	7	mm²	square millimetres	0.001550003	0	1
MEASURE_J_kg	34	8	J/kg	joules per kilogram	0.000429923	0	1
MEASURE_kJ_kg	35	8	kJ/kg	kilojoules per kilogram	0.429923	0	1
MEASURE_btu_lbm	36	8	Btu/lbm	Btu per pound mass	1	0	1
MEASURE_me_kg	37	9	me/hg	Meq. per 100 grams (CEC)	1	0	1
MEASURE_ml_ml	38	10	mL/mL	millilitres per millilitre	1	0	1
MEASURE_ppm	39	10	ppm	parts per million	1	0	1
MEASURE_mmhos_m	40	11	mmhos/m	millimhos per metre	0.001	0	1
MEASURE_mmho_cm	41	11	mmhos/cm	millimhos per centime-tre	0.1	0	1
MEASURE_mSiem_m	42	11	mS/m	millisiemens per metre	0.001	0	1
MEASURE_mhos_m	43	11	mhos/m	mhos per metre	1	0	1
MEASURE_siem_m	44	11	S/m	siemens per metre	1	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_siem	45	12	siem	siemens	1000	0	1
MEASURE_m_ohms	46	12	mhos	mhos	1	0	1
MEASURE_m_Siem	47	12	mS	milli siemens	1	0	1
MEASURE_dollar	48	13	$	United States Dollars	1	0	1
MEASURE_g_cc	49	14	g/cc	grams per cc	8.345404987	0	1
MEASURE_lbm_bbl	50	14	lbm/bbl	pounds per barrel	0.02380952	0	1
MEASURE_kgm_m3	51	14	kg/m³	kilograms per cubic metre	0.008345404	0	1
MEASURE_lbm_ft3	52	14	lbm/ft³	pounds per cubic foot	0.1336806	0	1
MEASURE_sg	53	14	sg	specific gravity	8.345404987	0	1
MEASURE_psi_kft	54	14	psi/kft	psi per 1000 feet	0.01925	0	1
MEASURE_psi_foot	55	14	psi/ft	psi per foot	19.2500064	0	1
MEASURE_mbarm_m	56	14	mbar/m	millibar (mass) per metre (make mass and force convertable)	0.08509941879	0	1
MEASURE_lbm_gal	57	14	ppg	pounds per gallon	1	0	1
MEASURE_kg_l	58	14	kg/L	kilograms per litre	8.345404987	0	1
MEASURE_barm_m	59	14	bar/m	bar (mass) per metre (make mass and force convertable)	85.09941879	0	1
MEASURE_kpam_m	60	14	kPa/m	kilopascal (mass) per metre (make mass and force convertable)	0.850994477	0	1
MEASURE_mg_l	61	14	mg/L	milligrams per litre	0.000008345404987	0	1
MEASURE_degsapi	62	14	degs-API	degrees API	1180.8748	131.5	2
MEASURE_darcy	63	15	darcy	darcies	1000	0	1
MEASURE_perm_m2	64	15	m²	square metres	1.01324996583E+15	0	1
MEASURE_md	65	15	md	millidarcies	1	0	1
MEASURE_bpd	66	16	bbl/D	barrels per day	0.029166666666	0	1
MEASURE_Mft3_d	67	16	Mft³/D	million cubic ft per day	5194.80486	0	1
MEASURE_ft3_d	68	16	ft³/D	cubic ft per day	0.00519480486	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_scfm	69	16	scfm	standard cubic ft per minute	7.480519	0	1
MEASURE_m3_sec	70	16	m³/s	cubic metres per second	15850.32213	0	1
MEASURE_mm3_d	71	16	km³/D	thousand cubic metres per day	183.4528024	0	1
MEASURE_m3_d	72	16	m³/D	cubic metres per day	0.183452802	0	1
MEASURE_m3_hr	73	16	m³/hr	cubic metres per hour	4.402867257	0	1
MEASURE_kft3_d	74	16	kft³/D	thousand cubic ft per day	5.19480486	0	1
MEASURE_gpm	75	16	gpm	gallons per minute	1	0	1
MEASURE_m3_min	76	16	m³/min	cubic metres per minute	264.1720351	0	1
MEASURE_ft3_sec	77	16	ft³/s	cubic ft per second	448.8311401	0	1
MEASURE_ft3_min	78	16	ft³/min	cubic ft per minute	7.480519	0	1
MEASURE_l_min	79	16	L/min	litres per minute	0.264172035	0	1
MEASURE_bbl_min	80	16	bbl/min	barrels per minute	42	0	1
MEASURE_Mft3_m3	81	17	Mft³/m³	thousand cubic ft per day to cubic metre per day	28316.84664	0	1
MEASURE_fr_none	82	17	none	unitless: any flow to flow with same units	1	0	1
MEASURE_Mft3_bpd	83	17	Mft³/bbl	million cubic ft per day to barrel per day	178107.5952	0	1
MEASURE_gpm_in	84	18	gpm/in	gpm per inch	0.026736112	0	1
MEASURE_m3_min_cm	85	18	m³/min/cm	cubic metres per minute per centimetre	17.93985067	0	1
MEASURE_l_min_cm	86	18	L/min/cm	liter per minute per centimetre	0.01793985067	0	1
MEASURE_m3_sec_m	87	18	m3/sec/m	cubic metres per second per metre	29.8999751	0	1
MEASURE_ft3_sec_ft	88	18	ft³/s/ft	cubic feet per second per ft	1	0	1
MEASURE_1_psf	89	19	1/psf	1 per lb per square foot	1	0	1
MEASURE_1_pa	90	19	1/Pa	1 per pascals	47.88025922	0	1
MEASURE_1_kpa	91	19	1/kPa	1 per 1000 pascals	0.04788025922	0	1
MEASURE_1_Gpa	92	19	1/GPa	1 per 1000000000 pascals	4.788025922E-08	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_1_psi	93	19	1/psi	1 per lb per square inch	0.0069444444444	0	1
MEASURE_1_Mpa	94	19	1/MPa	1 per 1000000 pascals	0.00004788025922	0	1
MEASURE_kdaN	95	20	kdaN	1000 deka newton	2248.089431	0	1
MEASURE_lbf	96	20	lbf	pounds force	1	0	1
MEASURE_N	97	20	N	newtons	0.2248089431	0	1
MEASURE_kip	98	20	kip	1000 pounds	1000	0	1
MEASURE_kN	99	20	kN	1000 newtons	224.8089431	0	1
MEASURE_sxs	100	20	100lbf	100 pounds	100	0	1
MEASURE_daN	101	20	daN	deka newton	2.248089431	0	1
MEASURE_tonf	102	20	ton(FPS)	english ton	2000	0	1
MEASURE_kgf	103	20	kgf	kilogram force	2.2046226218	0	1
MEASURE_klbf	104	20	klbf	1000 pounds	1000	0	1
MEASURE_gf	105	20	gram	gram	0.0022046226218	0	1
MEASURE_tonne_f	106	20	tonne	metric ton	2204.6226218	0	1
MEASURE_kgf_mt	107	21	kgf/m	kilogram force per metre	0.671968974	0	1
MEASURE_N_mt	108	21	N/m	Newton per metre	0.06852177	0	1
MEASURE_lbf_in	109	21	lbf/in	pounds force per inch	12	0	1
MEASURE_lbf_ft	110	21	lbf/ft	pounds force per foot	1	0	1
MEASURE_daN_m	111	21	daN/m	deka Newtons per metre	0.6852177	0	1
MEASURE_kdaN_m	112	21	kdaN/m	kilo deka Newtons per metre	685.2177	0	1
MEASURE_N_mm	113	21	N/mm	Newton per millimetre	68.52177	0	1
MEASURE_spm	114	22	spm	strokes per minute	1	0	1
MEASURE_sps	115	22	sps	strokes per second	60	0	1
MEASURE_lbf_foot	116	23	lbf/ft	pounds force per foot	1	0	1
MEASURE_ppf	117	23	ppf	optional weight per ft	1	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_dekaN_m	118	23	daN/m	deka newtons per metre	0.68521765857	0	1
MEASURE_kg_m	119	23	kg/m	kilogram per metre	0.67196897513	0	1
MEASURE_in_32nd	120	24	32nd"	1/32nd of an inch	0.0026041666667	0	1
MEASURE_m	121	24	m	s.i. metres	3.280839895	0	1
MEASURE_ft	122	24	ft	standard feet	1	0	1
MEASURE_in_64th	123	24	64th"	1/64th of an inch	0.0013020833333	0	1
MEASURE_in	124	24	in	inches	0.083333333333	0	1
MEASURE_um	125	24	µm	micrometre (micron)	0.000003280839895	0	1
MEASURE_in_16th	126	24	16th"	1/16th of an inch	0.0052083333333	0	1
MEASURE_cm	127	24	cm	centimetres	0.03280839895	0	1
MEASURE_mm	128	24	mm	millimetres	0.003280839895	0	1
MEASURE_slug	129	25	slug	slug	32.174048556	0	1
MEASURE_tonm	130	25	ton(FPS)	english ton	2000	0	1
MEASURE_gm	131	25	gram	gram	0.0022046226218	0	1
MEASURE_klbm	132	25	klbm	1000 pounds	1000	0	1
MEASURE_kipm	133	25	kip	1000 pounds	1000	0	1
MEASURE_tonne_m	134	25	tonne	metric ton	2204.6226218	0	1
MEASURE_kgm	135	25	kg	kilogram	2.2046226218	0	1
MEASURE_lbm	136	25	lbm	pounds mass	1	0	1
MEASURE_sxsm	137	25	100lbm	100 pounds	100	0	1
MEASURE_lbm_ft	138	26	lbm/ft	mass per unit length	1	0	1
MEASURE_kgm_m	139	26	kg/m	kg mass per metre	0.67196897514	0	1
MEASURE_kgm_hr	140	27	kg/hr	kilograms per hour	2.204623	0	1
MEASURE_lbm_hr	141	27	lbm/hr	pounds mass per hour	1	0	1
MEASURE_kgm_min	142	27	kg/min	kilograms per minute	132.277357308	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_lbm_min	143	27	lbm/min	pounds mass per minute	60	0	1
MEASURE_kgm_sec	144	27	kg/sec	kilograms per sec	7936.64143848	0	1
MEASURE_shot_ft	145	28	shot/ft	number per foot	1	0	1
MEASURE_dollar_ft	146	28	$/ft	number per metre	1	0	1
MEASURE_shot_m	147	28	shot/m	shots per metre	0.3048	0	1
MEASURE_dollar_m	148	28	$/m	dollars per metre	0.3048	0	1
MEASURE_ft_kft	149	29	ft/1000ft	feet per 1000 feet	1	0	1
MEASURE_decper	150	29	d%	decimal percent	100	0	1
MEASURE_m_km	151	29	m/1000m	metres per 1000 metres	1	0	1
MEASURE_NTU	152	29	NTU	NTU	1	0	1
MEASURE_none	153	29		no units	1	0	1
MEASURE_percent	154	29	%	percent	1	0	1
MEASURE_stks	155	0	strokes	stroke count	1	0	1
MEASURE_percent_min	156	30	%/min	percent per minute	0.016666666667	0	1
MEASURE_percent_sec	157	30	%/s	percent per second	1	0	1
MEASURE_kw	158	31	kW	kilowatt	1.3404825737	0	1
MEASURE_watt	159	31	Watt	watt	0.0013404825737	0	1
MEASURE_hp	160	31	hp	horsepower	1	0	1
MEASURE_w_m2	161	32	W/m²	watts per square metre	8.6482573727E-07	0	1
MEASURE_kw_m2	162	32	kW/m²	kilowatts per square metre	0.00086482573727	0	1
MEASURE_kw_cm2	163	32	kW/cm²	kilowatts per sq. cm.	8.6482573727	0	1
MEASURE_hp_in2	164	32	hp/in²	horsepower per sq. inch	1	0	1
MEASURE_kgf_m3	165	33	kg/m³	kilograms per cubic metre	0.000433527	0	1
MEASURE_gf_cc	166	33	g/cc	grams force per cc	0.433527504	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_psi_ft	167	33	psi/ft	lbs force per sq inch per foot	1	0	1
MEASURE_kpa_m	168	33	kPa/m	kilopascal per metre	0.044207502	0	1
MEASURE_lbf_gal	169	33	ppg	lbf per gallon - gradient	0.051948048	0	1
MEASURE_kgf_l	170	33	kg/L	kilograms per litre	0.433527504	0	1
MEASURE_lbf_ft3	171	33	psf/ft	lbf/ft2/ft	0.0069444444444	0	1
MEASURE_ksc_m	172	33	kg/cm²/m	kilograms per centime-tre squared per metre	0.004497202	0	1
MEASURE_pa_m	173	33	Pa/m	pascal per metre	0.000044207502	0	1
MEASURE_bar_m	174	33	bar/m	bar per metre	4.420749096	0	1
MEASURE_mbar_m	175	33	mbar/m	millibar per metre	0.004420749096	0	1
MEASURE_lbf_bbl	176	33	lbf/bbl	pounds force per barrel	0.001236858	0	1
MEASURE_ihg	177	34	in-Hg	inches of mercury	0.4911541	0	1
MEASURE_mmhg	178	34	mm-Hg	millimetres of mercury	0.019337	0	1
MEASURE_giga_pa	179	34	GPa	1000000000 pascals	145037.737	0	1
MEASURE_Mpsi	180	34	Mpsi	1000000 pounds per sq. inch	1000000	0	1
MEASURE_mega_pa	181	34	MPa	1000000 pascals	145.037737	0	1
MEASURE_kgf_cm2	182	34	kgf/cm²	kgf per sq cm	14.22334331	0	1
MEASURE_lbf_ft2	183	34	psf	pounds per sq. foot	0.0069444444444	0	1
MEASURE_mbar	184	34	mbar	millibar	0.01450377	0	1
MEASURE_lbf_in2	185	34	psi	pounds per sq. inch absolute (psia)	1	0	1
MEASURE_bar	186	34	bar	bar	14.50377	0	1
MEASURE_phsf	187	34	lbf/100ft²	pounds per 100 sq. ft	0.00006944444444 4	0	1
MEASURE_kpa	188	34	kPa	1000 pascals	0.145037737	0	1
MEASURE_ksi	189	34	ksi	thous. pounds per sq.in.	1000	0	1
MEASURE_pa	190	34	Pa	pascal	0.000145037737	0	1
MEASURE_inH2O	191	34	inH2O	pressure in water @ 60F	0.03609119	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_psi_ft_lb	192	35	psi/ft-lbf	psi per foot-pounds	1	0	1
MEASURE_psf_ft_lb	193	35	psf/ft-lbf	psf per foot-pounds	0.0069444444444	0	1
MEASURE_kpa_N_m	194	35	kPa/N-m	1000 pascals per newton-metres	0.196644767	0	1
MEASURE_pa_N_m	195	35	Pa/N-m	pascals per newton-metres	0.000196644767	0	1
MEASURE_ohm_m	196	36	ohm/m	ohms per metre	1	0	1
MEASURE_ohm_cm	197	36	ohm/cm	ohms per centimetre	100	0	1
MEASURE_ohm	198	37	ohm	ohms	1	0	1
MEASURE_m_ohm	199	37	m_ohm	milliohm	0.001	0	1
MEASURE_ohm_meter	200	38	ohm-m	ohm-metre	1	0	1
MEASURE_ft4	201	39	ft4	ft^4 moment of inertia	20736	0	1
MEASURE_in4	202	39	in4	in^4 moment of inertia	1	0	1
MEASURE_cm4	203	39	cm4	cm^4 moment of inertia	0.024025096	0	1
MEASURE_m4	204	39	m4	m^4 moment of inertia	2402509.6	0	1
MEASURE_F_ft	205	40	°F/ft	degrees f per foot	1	0	1
MEASURE_C_m	206	40	°C/m	degrees c per metre	0.54864	0	1
MEASURE_F_100ft	207	40	°F/100ft	degrees f per 100 ft	0.01	0	1
MEASURE_C_30m	208	40	°C/30m	deg c per 30 metres	0.018288	0	1
MEASURE_C_100m	209	40	°C/100m	deg c per 100 metres	0.0054864	0	1
MEASURE_K_m	210	40	K/m	deg k per metre	0.54864	0	1
MEASURE_deg_K	211	41	K	kelvin	1.8	-459.67	1
MEASURE_deg_C	212	41	°C	degress Celsius	1.8	32	1
MEASURE_deg_F	213	41	°F	degrees Fahrenheit	1	0	1
MEASURE_hrs	214	42	hr	time - hours	1	0	1
MEASURE_sec	215	42	sec	time seconds	0.00027777777777	0	1
MEASURE_minute	216	42	min	time - minutes	0.016666666666	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_tdy_hr	217	42	tdy_hr	current hour of the day based on sun time	24	1	5
MEASURE_day	218	42	days	time - day	24	0	1
MEASURE_hr_1000ft	219	43	hr/1000ft	hours per 1000 feet	3.6	0	1
MEASURE_sec_ft	220	43	sec/ft	seconds per feet	1	0	1
MEASURE_hr_1000m	221	43	hr/km	hours per 1000 metres	1.09728	0	1
MEASURE_usec_ft	222	43	µsec/ft	microseconds per feet	0.000001	0	1
MEASURE_usec_m	223	43	µsec/m	microseconds per metres	0.0000003048	0	1
MEASURE_sec_m	224	43	sec/m	seconds per metres	0.3048	0	1
MEASURE_MJ	225	44	MJ	Mega Joule	0.0698449005	0	1
MEASURE_daNKm	226	44	daN-km	deca Newton kilometre	69.8449005	0	1
MEASURE_ton_mi	227	44	ton-mi	ton miles	1	0	1
MEASURE_ft_kip	228	45	ft-kip	ft - 1000 lbf	1000	0	1
MEASURE_kN_m	229	45	kN-m	kiloNewton metre	737.56214929	0	1
MEASURE_kgf_m	230	45	kgf-m	kilogram force metre	7.2330138512	0	1
MEASURE_N_m	231	45	N-m	newton-metres	0.7375621493	0	1
MEASURE_ft_lbf	232	45	ft-lbf	foot-pounds	1	0	1
MEASURE_in_lbf	233	45	in-lbf	inch-pounds	0.083333333333	0	1
MEASURE_tdms	234	5	d:m:s	deg per min per sec brng	1	0	4
MEASURE_tazi	235	5	bearing	decimal degree bearing	1	0	1
MEASURE_tquaddm	236	5	quad-d:m	quadrant-degrees:min-utes	1	0	4
MEASURE_tquad	237	5	quad	quadrant-decimal degrees	1	0	4
MEASURE_ppb	238	10	ppb	Parts per billion	0.001	0	1
MEASURE_volpercent	239	10	%	Concentration percent	10000	0	1
MEASURE_tdm	240	5	deg:min	degrees:minutes	1	0	4
MEASURE_kft_hr	241	47	kft/hr	1000 ft per hr	0.27777777778	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_m_day	242	47	m/day	metre per day	3.79726839700593E-05	0	1
MEASURE_mph	243	47	mph	miles per hour	1.4666666667	0	1
MEASURE_knots	244	47	knots	knots	1.68781	0	1
MEASURE_m_hr	245	47	m/hr	metres per hour	0.00091134441528	0	1
MEASURE_ft_hr	246	47	ft/hr	feet per hour	0.00027777777778	0	1
MEASURE_m_min	247	47	m/min	metres per minute	0.054680664916	0	1
MEASURE_m_sec	248	47	m/s	metres per second	3.280839895	0	1
MEASURE_ft_min	249	47	ft/min	feet per minute	0.016666666667	0	1
MEASURE_ft_sec	250	47	ft/s	feet per second	1	0	1
MEASURE_ft_day	251	47	ft/day	feet per day	1.15740740740741E-05	0	1
MEASURE_km_hr	252	47	km/hr	kilometres per hr	0.91134441528	0	1
MEASURE_kpas	253	48	kPa/s	Kilopascals per second	1000000	0	1
MEASURE_pas	254	48	Pa/s	Pascals per second	1000	0	1
MEASURE_pfsn_hsf	255	48	pfsn/hsf	Lbf second to the n per 100 ft2	478.8	0	1
MEASURE_cp	256	48	cp	centipoise	1	0	1
MEASURE_pfs2_hsf	257	48	pfs²/hsf	Lbf second squared per 100 ft2	478.8	0	1
MEASURE_eqcp	258	48	eq._cp	equivalent centipoise	1	0	1
MEASURE_mpa_s	259	48	mPa/s	milli pascal sec	1	0	1
MEASURE_m3_m	260	49	m³/m	cubic metres per metre	10.763910417	0	1
MEASURE_gal_ft	261	49	gal/ft	gallon per foot	0.13368056414	0	1
MEASURE_l_m	262	49	L/m	liter per metre	0.010763910417	0	1
MEASURE_bbl_ft	263	49	bbl/ft	barrels per foot	5.614583694	0	1
MEASURE_ft3_ft	264	49	ft³/ft	cubic feet per foot	1	0	1
MEASURE_m3_sak	265	50	m³/sack	cubic metres per sack	35.31467	0	1
MEASURE_ft3_sak	266	50	ft³/sack	cubic feet per sack	1	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_gal_sak	267	50	gal/sack	gallons per sack	0.1336806	0	1
MEASURE_lit_50kg	268	51	L/50kg	litres per 50 kilogram	0.000320369268	0	1
MEASURE_ft3_74lb	269	51	ft³/74lb	cubic feet per 74 pounds	0.013513513	0	1
MEASURE_gal_94lb	270	51	gal/sk	gallons per 94 pounds	0.00142213366	0	1
MEASURE_gal_74lb	271	51	gal/74lb	gallons per 74 pounds	0.00180649411	0	1
MEASURE_m3_tonne	272	51	m³/tonne	cubic metres per metric tonne	0.0160184634	0	1
MEASURE_lit_tonne	273	51	L/tonne	liters per metric tonne	0.0000160184634	0	1
MEASURE_gal_100lb	274	51	gal/hlb	gallons per 100 pounds	0.0013368056414	0	1
MEASURE_ft3_lb	275	51	ft³/lb	cubic feet per pound	1	0	1
MEASURE_lit_454kg	276	51	L/45.4kg	litres per 45.4 kilogram (100 lbm)	0.00035282959	0	1
MEASURE_lit_426kg	277	51	L/42.6kg	liters per 42.6 kilogram (94 lbm)	0.000376020267	0	1
MEASURE_lit_336kg	278	51	L/33.6kg	liters per 33.6 kilogram (74 lbm)	0.000476739981	0	1
MEASURE_ft3_100lb	279	51	ft³/hlb	cubic feet per 100 pounds	0.01	0	1
MEASURE_ft3_94lb	280	51	ft³/sk	cubic feet per 94 pounds	0.010638297	0	1
MEASURE_lit_100kg	281	51	L/100kg	liters per 100 kilogram	0.000160184634	0	1
MEASURE_volts	282	52	Volts	volts	1	0	1
MEASURE_ml	283	53	mL	milliliters	3.53146667215E-05	0	1
MEASURE_ft3	284	53	ft³	cubic feet	1	0	1
MEASURE_bbl	285	53	bbl	barrel	5.614583694	0	1
MEASURE_gal	286	53	gal	gallon	0.13368056414	0	1
MEASURE_m3	287	53	m³	cubic metres	35.314667215	0	1
MEASURE_in3	288	53	in³	cubic inches	0.0005787037037	0	1
MEASURE_mm3	289	53	mm³	cubic millimetres	3.53146667215E-08	0	1
MEASURE_kl	290	53	kL	kilolitres	35.3146667215	0	1
MEASURE_ltr	291	53	L	litre	0.0353146667215	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_cc	292	53	cc	cubic centimetres	3.53146667215E-05	0	1
MEASURE_bbl_stk	293	54	bbl/stk	barrels per stroke	42	0	1
MEASURE_l_stk	294	54	L/stk	litres per stroke	0.264172035	0	1
MEASURE_ft3_stk	295	54	ft³/stk	cubic feet per stroke	7.480519	0	1
MEASURE_m3_stk	296	54	m³/stk	cubic metres per stroke	264.1720355	0	1
MEASURE_gal_stk	297	54	gal/stk	gallons per stroke	1	0	1
MEASURE_bbl_m	298	49	bbl/m	barrels per metre	1.71132510994	0	1
MEASURE_ft_sec2	299	55	ft/sec²	feet per second per second	1	0	1
MEASURE_m_sec2	300	55	m/sec²	metres per second per second	3.280839895	0	1
MEASURE_btu	301	56	BTU	BTU (traditional)	1	0	1
MEASURE_kJ	302	56	kJ	kilojoules	0.9480470223132	0	1
MEASURE_km	303	24	km	kilometres	3280.83989501	0	1
MEASURE_mi	304	24	mi	miles	5280	0	1
MEASURE_yr	305	42	yrs	years	8760	0	1
MEASURE_bq	306	57	Bq	becquerel	1	0	1
MEASURE_curie	307	57	curie	curie	37000000000	0	0
MEASURE_lbsnft2	308	59	lb*s^n'/ft²	API K prime	1	0	1
MEASURE_pasn	309	59	Pa*s^n'	SI K prime	0.020885434	0	0
MEASURE_scfbbl	310	60	scf/bbl	standard cubic feet per barrel	1	0	1
MEASURE_scmm3	311	60	scm/m³	standard cubic metres per cubic metre	5.6145835	0	1
MEASURE_scfgal	312	60	scf/gal	standard cubic feet per gallon	42.000042	0	1
MEASURE_scff3	313	60	scf/ft³	standard cubic feet per cubic feet	5.6145837	0	1
MEASURE_scfm3	314	60	scf/m³	standard cubic feet per cubic metre	0.1589873	0	1
MEASURE_sack	315	25	94lb sacks	sacks of cement	94	0	1
MEASURE_galbbl	316	61	gal/bbl	gallons / barrel	2.3809524	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_cpercent	317	61	%	percent (ratio)	1	0	1
MEASURE_lsack	318	61	L/ft³	litres / ft3	3.53146624713	0	1
MEASURE_gal10bbl	319	61	gal/(10*bbl)	gallons / 10 barrel	0.23809524	0	1
MEASURE_gal100sk	320	61	gal/(100*sk)	gallons / 100 sacks	0.13368056	0	1
MEASURE_ft3sk	321	61	ft³/ft³	ft3/ft3	100	0	1
MEASURE_galsk	322	61	gal/ft³	gallons / ft3	13.368056	0	1
MEASURE_lm3	323	61	L/m³	litres / m3	0.1	0	1
MEASURE_galMgal	324	61	gal/Mgal	gallons / 1000 gallons	0.1	0	1
MEASURE_scf	325	62	scf	standard cubic feet	1	0	1
MEASURE_scm	326	62	scm	standard cubic metres	35.3146667215	0	1
MEASURE_Mscf	327	62	Mscf	1000 standard cubic feet	1000	0	1
MEASURE_MMscf	328	62	MMscf	10^6 standard cubic feet	1000000	0	1
MEASURE_Mscm	329	62	1000 scm	1000 standard cubic metres	35314.6667215	0	1
MEASURE_hhp	330	31	hhp	hhp	0.999942	0	1
MEASURE_jgk	331	63	joule/gK	joules per gram kelvin	1	0	1
MEASURE_WmK	332	64	W/mK	Watts per meter kelvin	1	0	1
MEASURE_BTUlbmF	333	63	BTU/lbm°F	BTU per pound mass degree Fahrenheit	4.1868	0	1
MEASURE_kcalkgC	334	63	kcal/kg°C	kilocalories per kilogram degree Celsius	4.184	0	1
MEASURE_BTUhftF	335	64	BTU/hft°F	BTU per hour foot degree Fahrenheit	1.730735	0	1
MEASURE_kcalhmC	336	64	kcal/h m °C	kilocalories per hour metre degree Celsius	1.162222	0	1
MEASURE_kjmhm2K	337	64	kJ m/h m² K	kilojoule metres per hour square metre kelvin	0.277777778	0	1
MEASURE_us_ft	338	24	usft	US survey feet	1.000002	0	1
MEASURE_wire_center	339	24	V+H	Sq root of 0.1 mile, used only with Bell Wire Center V and H geodetic system	1669.68267012981	0	1
MEASURE_yard	340	24	yard	International Yard	3	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_links	341	24	lk	Links	0.66	0	1
MEASURE_E_06_degC	342	65	E-06/°C	Thermal Exp. E-06/degC	5.55555555555556E-07	0	1
MEASURE_E_06_degF	343	65	E-06/°F	Thermal Exp. E-06/degF	0.000001	0	1
MEASURE_E_06_degR	344	65	E-06/°R	Thermal Exp. E-06/degR	0.000001	0	1
MEASURE_E_06_K	345	65	E-06/K	Thermal Exp. E-06/K	5.55555555555556E-07	0	1
MEASURE_Percent_degC	346	66	%/°C	Temp Deration %/degC	0.555556	0	1
MEASURE_Percent_degF	347	66	%/°F	Temp Deration %/degF	1	0	1
MEASURE_Percent_degR	348	66	%/°R	Temp Deration %/degR	1	0	1
MEASURE_Percent_K	349	66	%/K	Temp Deration %/K	0.555556	0	1
MEASURE_dollar_kg	350	67	$/kg	CostPerUnitMass $/kg	907.185	0	1
MEASURE_dollar_lbm	351	67	$/lbm	CostPerUnitMass $/lbm	2000	0	1
MEASURE_dollar_ton	352	67	$/ton	CostPerUnitMass $/ton	1	0	1
MEASURE_dollar_tonne	353	67	$/tonne	CostPerUnitMass $/tonne	0.907185	0	1
MEASURE_EMPTY	354	0			1	0	1
MEASURE_degC_MPa	355	69	°C/MPa	Joule-ThompsonCoefficient degC/MPa	0.0124106	0	1
MEASURE_degF_psi	356	69	°F/psi	Joule-ThompsonCoefficient degF/psi	1	0	1
MEASURE_kg_cm2m	357	14	kg/cm²m	Density(CementSlurry) kg/cm²m	83.454	0	1
MEASURE_1_bar	358	19	1/bar	Compressibility 1/bar	0.04788025922	0	1
MEASURE_E_06_bar	359	19	E-06/bar	Compressibility E-06/bar	4.788025922E-10	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_E_06_kPa	360	19	E-06/kPa	Compressibility E-06/kPa	4.788025922E-08	0	1
MEASURE_E_06_MPa	361	19	E-06/MPa	Compressibility E-06/MPa	4.788025922E-11	0	1
MEASURE_E_06_psi	362	19	E-06/psi	Compressibility E-06/psi	6.944444444E-09	0	1
MEASURE_lbf_s_n_100ft2	363	59	lbf-s^n/100ft²	GeneralConsistencyIndex lbf-s^n/100ft²	0.01	0	1
MEASURE_Percent_day	364	30	%/day	DailyPercentage %/day	0.000011574	0	1
MEASURE_cal_g	365	8	cal/g	Enthalpy cal/g	1.8	0	1
MEASURE_kW_hr_kg	366	8	kW-hr/kg	Enthalpy kW-hr/kg	1547.72	0	1
MEASURE_atm	367	34	atm	FDHCPressure atm	14.6959	0	1
MEASURE_kPag	368	34	kPag	FDHCPressure kPag	0.145038	0	1
MEASURE_MPag	369	34	MPag	FDHCPressure MPag	145.038	0	1
MEASURE_psig	370	34	psig	FDHCPressure psig	1	0	1
MEASURE_cal_g_degC	371	63	cal/g-°C	FDHCSpecificHeat cal/g-degC	4.184	0	1
MEASURE_J_kg_degC	372	63	J/kg-°C	FDHCSpecificHeat J/kg-degC	0.000999332	0	1
MEASURE_kW_hr_kg_degC	373	63	kW-hr/kg-°C	FDHCSpecificHeat kW-hr/kg-degC	3597.59148	0	1
MEASURE_dN_m	374	21	dN/m	FDHCSurfaceTension dN/m	0.006852177	0	1
MEASURE_dyne_cm	375	21	dyne/cm	FDHCSurfaceTension dyne/cm	0.0000685218	0	1
MEASURE_deg_R	376	41	°R	FDHCTemperature degR	1	-459.67	1
MEASURE_W_m_degC	377	64	W/m-°C	FDHCThermalConductivity W/m-degC	1	0	1
MEASURE_dN	378	20	dN	Force dN	0.0224809	0	1
MEASURE_lbf_m	379	21	lbf/m	Force(Friction) lbf/m	0.3048	0	1
MEASURE_N_ft	380	21	N/ft	Force(Friction) N/ft	0.224809	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_kPa_100m	381	70	kPa/100m	FrictionalLoss kPa/100m	0.0442075	0	1
MEASURE_psi_100ft	382	70	psi/100ft	FrictionalLoss psi/100ft	1	0	1
MEASURE_bar_ft	383	14	bar/ft	GasGradient bar/ft	279.198	0	1
MEASURE_kPa_ft	384	14	kPa/ft	GasGradient kPa/ft	2.79198	0	1
MEASURE_MPa_ft	385	14	MPa/ft	GasGradient MPa/ft	2791.98	0	1
MEASURE_MPa_m	386	14	MPa/m	GasGradient MPa/m	850.994	0	1
MEASURE_psi_m	387	14	psi/m	GasGradient psi/m	5.8674	0	1
MEASURE_E03m3_day	388	16	E+03m³/day	Rate(Gas Inj/Prod) E+03m3/day	183.452814138	0	1
MEASURE_E03m3_min	389	16	E+03m³/min	Rate(Gas Inj/Prod) E+03m3/min	264172.052358	0	1
MEASURE_MMscf_day	390	16	MMscf/day	Rate(Gas Inj/Prod) MMscf/day	5194.80486	0	1
MEASURE_MMscf_min	391	16	MMscf/min	Rate(Gas Inj/Prod) MMscf/min	7480519.48048	0	1
MEASURE_m3_bbl	392	60	m³/bbl	Gas/LiquidRatio m3/bbl	35.3147	0	1
MEASURE_m3_ft3	393	60	m³/ft³	Gas/LiquidRatio m3/ft3	198.277	0	1
MEASURE_m3_gal	394	60	m³/gal	Gas/LiquidRatio m3/gal	1483.22	0	1
MEASURE_m3_l	395	60	m³/l	Gas/LiquidRatio m3/l	5614.58	0	1
MEASURE_m3_m3	396	60	m³/m³	Gas/LiquidRatio m3/m3	5.61458	0	1
MEASURE_scf_l	397	60	scf/L	Gas/LiquidRatio scf/l	158.987	0	1
MEASURE_E03m3_bbl	398	60	E+03m³/bbl	Gas/OilRatio E+03m3/bbl	35314.7	0	1
MEASURE_E03m3_ft3	399	60	E+03m³/ft³	Gas/OilRatio E+03m3/ft3	198277	0	1
MEASURE_E03m3_gal	400	60	E+03m³/gal	Gas/OilRatio E+03m3/gal	1483220	0	1
MEASURE_E03m3_l	401	60	E+03m³/l	Gas/OilRatio E+03m3/l	5614580	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_E03m3_m3	402	60	E+03m³/m³	Gas/OilRatio E+03m3/m3	5614.58	0	1
MEASURE_MMscf_bbl	403	60	MMscf/bbl	Gas/OilRatio MMscf/bbl	1000000	0	1
MEASURE_MMscf_ft3	404	60	MMscf/ft³	Gas/OilRatio MMscf/ft3	5614580	0	1
MEASURE_MMscf_gal	405	60	MMscf/gal	Gas/OilRatio MMscf/gal	42000000	0	1
MEASURE_MMscf_l	406	60	MMscf/l	Gas/OilRatio MMscf/l	158987000	0	1
MEASURE_MMscf_m3	407	60	MMscf/m³	Gas/OilRatio MMscf/m3	158987	0	1
MEASURE_jts_day	408	72	jts/day	Jts_Per_Time jts/day	0.041667	0	1
MEASURE_jts_hr	409	72	jts/hr	Jts_Per_Time jts/hr	1	0	1
MEASURE_jts_min	410	72	jts/min	Jts_Per_Time jts/min	60	0	1
MEASURE_jts_s	411	72	jts/s	Jts_Per_Time jts/s	3600	0	1
MEASURE_1000ft	412	73	1000ft	LengthInterval 1000ft	10	0	1
MEASURE_305m	413	73	305m	LengthInterval 305m	10	0	1
MEASURE_100ft	414	73	100ft	LengthInterval_1 100ft	1	0	1
MEASURE_30_5m	415	73	30.5m	LengthInterval_1 30.5m	1	0	1
MEASURE_gal_day	416	16	gal/day	Rate(LiquidCirculation) gal/day	0.000694444	0	1
MEASURE_l_day	417	16	L/day	Rate(LiquidCirculation) l/day	0.000183453	0	1
MEASURE_hrs_250m	418	43	hrs/250m	OperationTimes hrs/250m	4.38911986	0	1
MEASURE_hrs_305m	419	43	hrs/305m	OperationTimes_1 hrs/305m	3.59763923	0	1
MEASURE_hrs_100ft	420	43	hrs/100ft	OperationTimes_2 hrs/100ft	36	0	1
MEASURE_hrs_30_5m	421	43	hrs/30.5m	OperationTimes_2 hrs/30.5m	35.9763923	0	1
MEASURE_change_bar	422	74	bar	Pressure Change bar	14.5038	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_kg_cm2	423	74	kg/cm²	Pressure Change kg/cm²	14.2233	0	1
MEASURE_kPa	424	74	kPa	Pressure Change kPa	0.145038	0	1
MEASURE_MPa	425	74	MPa	Pressure Change MPa	145.3077	0	1
MEASURE_psi	426	74	psi	Pressure Change psi	1	0	1
MEASURE_degC	427	75	°C	TemperatureChange degC	1.8	0	1
MEASURE_degF	428	75	°F	TemperatureChange degF	1	0	1
MEASURE_K	429	75	K	TemperatureChange K	1.8	0	1
MEASURE_degC_100ft	430	40	°C/100ft	TemperatureGradient degC/100ft	0.018	0	1
MEASURE_degF_30m	431	40	°F/30m	TemperatureGradient degF/30m	0.01016	0	1
MEASURE_months	432	42	months	Time months	730	0	1
MEASURE_hr_day	433	76	hr/day	Time_hr_per_day hr/day	1	0	1
MEASURE_torque_lbf_m	434	45	lbf-m	Torque lbf-m	3.28084	0	1
MEASURE_torque_N_f	435	45	N-ft	Torque N-ft	0.224809	0	1
MEASURE_dollar_ft3	436	77	$/ft³	CostPerUnitVolume $/ft3	1	0	1
MEASURE_dollar_m3	437	77	$/m³	CostPerUnitVolume $/m3	0.028317	0	1
MEASURE_dollar_bbl	438	77	$/bbl	CostPerUnitVolume_1 $/bbl	0.178107595	0	1
MEASURE_dollar_bbl_day	439	78	$/bbl/day	CostPerUnitVolume_1PerTime $/bbl/day	1	0	1
MEASURE_dollar_ft3_day	440	78	$/ft³/day	CostPerUnitVolume_1PerTime $/ft3/day	5.61457	0	1
MEASURE_dollar_m3_day	441	78	$/m³/day	CostPerUnitVolume_1PerTime $/m3/day	0.158987	0	1
MEASURE_degR	442	75	°R	TemperatureChange degR	1	0	1
MEASURE_Atm	443	74	atm	PressureChange Atm	14.6959	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
MEASURE_1_degC	444	65	1/°C	Thermal Exp. 1 / deg C	0.555555555555556	0	1
MEASURE_1_degF	445	65	1/°F	Thermal Exp. 1 / deg F	1	0	1
MEASURE_1_degR	446	65	1/°R	Thermal Exp. 1 / deg R	1	0	1
MEASURE_1_K	447	65	1/K	Thermal Exp. 1/K	0.555555555555556	0	1
MEASURE_arcsec	448	5	asec	Seconds (of arc)	2.77777777777778E-04	0	1
MEASURE_parametric	449	0	<None>	Parametric - actual measure_id in another table	1	0	7
MEASURE_1_ft	450	79	/ft	per foot	1	0	1
MEASURE_1_m	451	79	/m	per meter	0.3048	0	1
MEASURE_perm_um2	452	15	um²	square micrometers	1013.24996583	0	1
MEASURE_bbl_hr	453	16	bbl/hr	barrels per hour	0.7	0	1
MEASURE_bbl_ton	454	51	bbl/ton	barrels per ton	0.002807291847	0	1
MEASURE_cc_30min	455	16	cc/30min	cc per 30 minutes	0.0000088057345	0	1
MEASURE_MMscm	456	62	MMscm	10^6 standard cubic meters	35314666.7215	0	1
MEASURE_ft3_ton	457	51	ft³/ton	cubic feet per ton	0.0005	0	1
MEASURE_kw_mm2	458	32	kW/mm²	kilowatts per square millimeter	864.82573727	0	1
MEASURE_m_30m	459	29	m/30m	meters per 30 meters	33.3333333333333	0	1
MEASURE_ft_100ft	460	29	ft/100ft	feet per 100 feet	10	0	1
MEASURE_millivolts	461	52	mV	millivolts	0.001	0	1
MEASURE_nM	462	24	nM	nautical miles	6076.11548556	0	1
MEASURE_lbm_1000gal	463	14	lbm/1000gal	pounds per 1000 gallons	0.001	0	1
MEASURE_tonne_km	464	44	tonne-km	tonne kilometers	1.77399809437	0	1
MEASURE_Mft3	465	53	Mft³	thousand cubic feet	1000	0	1
MEASURE_s_l	466	80	s/l	seconds per litre	1	0	1
MEASURE_s_qt	467	80	s/qt	seconds per quart	0.9463529	0	1

measure_name	measure_id	type_id	measure_label	measure_description	multiplier	offset	conv_code
kdollars	468	13	$(1000s)	1000 US Dollars	1000	0	1
MEASURE_in_frac	469	24	in-fract	inches fractions	8.33333333333333E-02	0	1
MEASURE_mg_l_conc	470	10	mg/L	mg per liter (concentration)	1	0	1
MEASURE_1_in	471	79	per inch	Number per inch	12	0	1
MEASURE_ml_30min	472	16	ml/30 min	ml per 30 minutes	0.0000088057345	0	1
MEASURE_mmscfbbl	473	60	Mscf/bbl	1000 standard cubic feet per barrel	1000	0	1
MEASURE_kscmm3	474	60	Kscm/m³	1000 standard cubic metres per cubic metre	5614.5835	0	1
MEASURE_baume	475	14	°Bé	Concentration (Degrees Baumé)	1	0	0
MEASURE_m3_m3_liquid_conc	476	61	m³/m³	Liquid/Liquid Ratio m³/m³	100	0	1
MEASURE_bbl_bbl	477	61	bbl/bbl	barrels per barrel	100	0	1

Appendix D: Support Locations

Contacting Support

Landmark operates Technical Assistance Centers (TACs) in Australia, the United Kingdom, and the United States. Additional support is also provided through local support offices around the world. Local support office information is listed below. If problems cannot be resolved at the district level, our escalation team is called to resolve your incidents quickly.

Support information is always available on the Landmark Graphics Support internet page located at: http://css.lgc.com/CustomerSupport/CustomerSupportHome.jsp.

Technical Assistance Centers

North America 7:30 am - 5:30 pm Central Standard Time Monday - Friday, excluding holidays	**713-839-2200 (Houston, TX, USA)** **Toll Free 1-877-435-7542** **(1-877-HELP-LGC)** Fax: 713-839-2168 (Houston, TX) Fax: 907-275-2655 (Anchorage, AK) Fax: 303-796-0807 (Denver, CO) Fax: 403-262-1929 (Calgary, Canada) Email: support@lgc.com
Latin America (Spanish, Portuguese, English) 7:00 am - 5:00 pm Central Standard Time Local normal business hours	**1-713-839-3405 (Houston,TX,USA)** Fax: 713-839-3646 Email: soporte@lgc.com Toll Free from: Argentina: 0800-800-5263 Brazil: 0800-891-0837 Chile: 800-201-898 Colombia: 01800-915-4743 Mexico: 001-888-438-1296 Peru: 0800-51634 Trinidad: 1-888-438-1296 Venezuela: 0-800-526-3627 Toll Free from local area: Ecuador (Quito) (02)226-1908

Europe, Africa, Middle East
8:00 am - 5:30 pm Local Time
Monday - Friday, excluding holidays

44-1372-868686 (Leatherhead, UK)
Fax: 44-1372-868601 (Leatherhead, UK)
Fax: 44-1224-723260 (Aberdeen, UK)
Email:
eame_helpdesk@lgc.com
ssasupport@lgc.com (Southern Africa)

Asia, Pacific
8:00 am - 5:00 pm Local Time
Monday-Friday, excluding holidays

61-8-9481-4488 (Perth, Australia)
Toll-free 1-800-448-488
Fax: 61-8-9481-1580
Email:
apsupport@lgc.com
FSU_support@lgc.com

Toll-Free from:

China:	10-800-6100-253
Indonesia:	001-803-61284
Japan:	00531-61-0021
Malaysia	1800-803-687
New Zealand	0800-400-555
Philippines	1800-1611-0207
South Korea	00308-61-0046
Taiwan	0080-161-1350
Thailand	001-800-611-2784

Toll Free from local area:
Vietnam: 84-8-9191901

District Support Offices

Algeria (Algiers)
8:30 am - 4:30 pm Local Time
Saturday - Wednesday excluding holidays

213 21 37 72 39
Email: eame_helpdesk@lgc.com

Angola (Luanda)
8:00 am - 5:00 pm Local Time
Monday - Friday, excluding holidays

1-817-493-5900
Fax: 1-817-493-560
Email: eame_helpdesk@lgc.com

Argentina (Buenos Aires)
9:00 am - 6:00 pm
Local time

54-11-4312-8411
Toll Free 0800-800-5263
Fax: 54-11-4311-9566
Email: soporte@lgc.com

Australia (Perth)
8:00 am - 5:00 pm Local Time
Monday - Friday, excluding holidays

61-8-9481-4488
Toll Free 1800-448-488
Fax: 61-8-9481-1580
Email: apsupport@lgc.com

Brazil (Rio de Janeiro) 8:00 am - 5:30 pm Local Time	**55-21-3974-4000 or** **Toll Free 0800-891-0837** Fax: 55-21-3974-4002 Email: soporte@lgc.com
Brunei (Bandar Seri Bagawan) 8:30 am - 5:30 pm Local Time Monday - Friday, excluding holidays	**67-3-233-5319** Email: apsupport@lgc.com
Canada (Calgary) 7:30 am - 5:30 pm Central Standard Time Monday-Friday, excluding holidays	**Toll Free 1-877-435-7542** **(1-877-HELP-LGC)** Fax: 403-262-1929 (Calgary, Canada) Fax: 713-830-2168 (Houston, TX) Email: support@lgc.com
Chile (TAO TAC, Houston, Texas) Local normal business hours	**Toll Free 800-201-898** Fax: 1-713-839-3646 Email: soporte@lgc.com
Colombia (Bogota) 8:00 am - 5:00 pm Local Time	**57-1-326-4000** **57-1-326-6710** **Toll Free 01800-915-4743** Fax: 57-1-326-6717 Email: soporte@lgc.com
Ecuador (Quito) 8:00 am - 5:00 pm Local Time	**59-32-226-1844** **Toll Free from Quito (02)226-1908** Fax: 59-32-226-2590 Email: soporte@lgc.com
Egypt (Cairo) 8:00 am - 4:00 pm Local Time Saturday - Wednesday, excluding holidays	**20-2-759-1717** **(ask for Landmark Technical Support)** Email: eame_helpdesk@lgc.com
India (New Delhi) 9:00 am - 5:30 pm Local Time Local Business Days, excluding holidays	**91-11-622-1885** (c/o Samit Enterprises) Fax: 91-11-647-9246 Email: apsupport@lgc.com
Indonesia (Jakarta) 7:30 am - 4:30 pm Local Time Monday - Friday, excluding holidays	**62-21-3003-9039 or** **Toll Free 001-803-61284** Fax: 62-21-3003-9088 Email: apsupport@lgc.com
Japan 8:00 am - 5:00 pm Local Time Monday - Friday, excluding holidays	**Toll Free 00531-61-0021** Email: apsupport@lgc.com

Malaysia (Kuala Lumpur) 8:30 am - 5:30 pm Local Time Monday - Friday, excluding holidays	**603-2164-1121 or** **Toll Free 1-800-803-687** Fax: 603-2164-1135 Email: apsupport@lgc.com
Mexico (Reynosa) 8:00 am - 6:00 pm Local Time	**52-555-208-3533** **52-555-208-3868** **Toll Free 001-888-438-1296** Local Office Fax: 52-555-514-7646 Support Fax: 1-713-839-3646 Email: soporte@lgc.com
New Zealand (New Plymouth) 8:00 am - 5:00 pm Local Time Monday - Friday, excluding holidays	**61-6-755-2318** **Toll Free 0800-400-555** Fax: 64-6-755-2407 Email: apsupport@lgc.com
Nigeria (Lagos) 8:00 am - 5:00 pm Local Time Monday - Friday, excluding holidays	**234-1-461-0780** **(ask for Landmark Technical Support)** Fax: 234-1-262-0769 Email: eame_helpdesk@lgc.com
People's Republic of China (Beijing) 9:00 am - 5:30 pm Local Time Monday - Friday, excluding holidays	**86-10-8486-4501** **Toll Free 10-800-6100-253 or** **10-800-810-0209** Fax: 86-10-8486-4819 Email bjsupport@lgc.com or apsupport@lgc.com
Peru (Lima) Local normal business hours	**Toll Free 0800-51634** Fax: 001-713-839-9646 Email: soporte@lgc.com
Russia (Moscow) 7:00 am - 5:00 pm Local Time Local Business Days, excluding holidays	**7-095-960-2926** **7-095-960-2927** **(ask for Landmark Technical Support)** Fax: 7-095-755-8301 Email: eame_helpdesk@lgc.com
South Korea 8:00 am - 5:00 pm Local Time Monday - Friday, excluding holidays	**Toll Free 00308-61-0046** Email: apsupport@lgc.com
Taiwan 8:30 am - 5:30 pm Local Time Monday-Friday, excluding holidays	**Toll Free 00801-61-1350** Email: apsupport@lgc.com

Thailand (Bangkok) 8:00 am - 5:00pm Local Time Monday - Friday, excluding holidays	**66-2-278-8100** **Toll Free 001-800-611-2784** Fax: 66-2-278-8199 Email: apsupport@lgc.com
Trinidad & Tobago (TAO TAC, Houston, TX) 7:00 am - 5:00 pm Central Standard Time (Houston, TX) Local normal business hours	**Toll Free: 1-888-438-1296** Fax: 1-713-839-3646 Email: soporte@lgc.com
United Arab Emirates (Dubai) 7:00 am - 5:00 pm Local Time Local Business Days, excluding holidays	**+971-4-3036446** **(ask for Landmark Technical Support)** Fax: +971-4-3315837 Email: gulf_support@lgc.com eame_helpdesk@lgc.com
United Kingdom 8:00 am - 5:30 pm Local Time Monday - Friday, excluding holidays	**44-1372-868686 (Leatherhead)** Fax: 44-1372-868601 (Leatherhead) Fax 44-1224-723260 (Aberdeen) Email: eame_helpdesk@lgc.com
United States (Anchorage) 7:30 am - 5:30 pm Central Standard Time Monday - Friday, excluding holidays	**Toll Free 1-877-435-7542** *(1-877-HELP-LGC)* Fax: 907-275-2655 Email: support@lgc.com
United States (Denver) 7:30 am - 5:30 pm Central Standard Time Monday - Friday, excluding holidays	**Toll Free 1-877-435-7542** *(1-877-HELP-LGC)* Fax: 303-796-0807 Email: support@lgc.com
United States (Houston) 7:30 am - 5:30 pm Central Standard Time Monday - Friday, excluding holidays	**713-839-2200** **Toll Free 1-877-435-7542** *(1-877-HELP-LGC)* Fax: 713-839-2168 Email: support@lgc.com
Venezuela (Caracas) 8:00 am - 5:00 pm Local Time	**58-212-953-0774** **Toll Free 0-800-526-3627** Fax: 58-212-952-3845 Email: soporte@lgc.com
Vietnam (Ho Chi Minh City) 8:00 am - 5:00 pm Local Time Monday - Friday, excluding holidays	**84-8-910-1901** **Toll Free 84-8-9191901** Fax: 84-8-910-1902 Email: apsupport@lgc.com

Helpful internet links are shown below.

Name	Website Address
Landmark Graphics home page	http://www.lgc.com
Landmark Graphics Support Website	http://css.lgc.com/CustomerSupport/CustomerSupportHome.jsp
Oracle home page	http://www.oracle.com
FLEXlm license management software home page	http://www.macrovision.com/support/by_category/Software_Licensing.shtml
Microsoft SQL Server home page	http://www.microsoft.com/sql/default.asp
Acrobat Reader	http://www.adobe.com
Microsoft MSDE	http://www.microsoft.com/sql/default.asp

Index

A

Action > Exit 57
  Data Migration 86
Action > Export 57
Action > Start Data Migration 85
Active field name 55
Add Custom Stored Functions 156
Add Mappings to Mapping Set 67
Applications selection 79
Apply Unit Measure System 89
Automatic mode 76

B

Build the staging area 87

C

CasingSeat 1, 116, 159
Change Zero values to NULL 44
Check DST Flow Rates and Flow Period Redesign 46
Check Lithology mappings and use of the PK_GROSLITH picklist 44
Check Logging Intervals information / services format 44
Clean Up BHAs 23
Clean Up Rig and Rig Equipment Data 17
Clean Up Time Values 21
Comments field name 55
COMPASS 1, 73, 115, 116, 159
COMPASS Post Migration Steps 139
Convert Daily Holesize Records to use the Hole Section Table if necessary 30
Copy a Mapping Set 62
Copy Legacy Files 137
Create a New Mapping Set 65
Create the Staging Area User 154

D

Data Merge Tool 116
  Duplicate Field 125
  Master Field 125
  purpose 116
  Using 119
Data Merging Tool 2
  Procedure 124
Data Merging Tool window 119, 125
  Duplicate Business Object Field 120
  EDM Database Connection dialog box 124
  Master Business Object Field 120
  Merge Business Objects 125
  Merge Button 121, 122
Data Merging window
  ODBC DSN 97
Data Migration 9, 73, 76
  Action > Exit 86
  Action > Start Data Transfer 85
  Apply Unit Measure System 89
  Build the staging area 87
  Change Zero value NULL 44
  Check DST Flow Rates and Flow Period Redesign 46
  Check Lithology mappings and use of the PK_GROSLITH picklist 44
  Check Logging Intervals information / services format 44
  Clean Up BHAs 23
  Clean Up Rig and Rig Equipment Data 17
  Clean Up Time Values 21
  Convert Daily Holesize Records to use the Hole Section Table if necessary 30
  data transfer preparation 74
  Database Connections 82
  DIMS pre-transfer preparation - QA 75
  DST Flow Rates and Flow Period Redesign 16
  Ensure all Sidetrack Records are Numbered and Assigned a Parent Sidetrack 44
  Ensure all Wells belonging to the Same Platform or Pad can be Grouped Together 28
  Ensure Casing and Wellbore Equipment components picklist in EDM match the DIMS Component Group Name 45
  Ensure Consistent Measurement Points in Datums and Correct Reference Depth Elevations 34
  Ensure Kick-Off Dates for Sidetracks are Complete and Correct 32
  Ensure Offshore Wells are Marked with the Offshore Flag 28
  Ensure Perforated Assembly Name Has a Value that Matches one of the Assemblies in the Well if possible 29
  Ensure Pool Names and Formation Names are Consistent 30
  Ensure RDL Flags are Removed for RDL the values DAILY.pitdepth and DAILY.pit_tvd 42
  Ensure Support Craft Items are Consistent (Within a Given Well) 31

Ensure that All Wells were Entered with the Same Reporting Standard and Using the Same Reporting Time 29
Ensure that the Last Casing/Next Casing Size Records are Valid and Consistent from Day-to-Day within an Event 33
Ensure that the new DIMS SYSINFO Parameters Being Used by the Migration Toolkit are Present 42
Ensure the Personnel Records are Consistent (Within a Given Well and Event) 32
Group Like Bulk Products Together 26
Group Like Mud Products Together 26
Identify Any Bits Not Associated with a BHA 25
Identify Orphan Data 17
Interactive mode 76
link tables (post transfer) 89
Log 84
Look for Blank or Invalid Keys in DAYCOST 43
Main Menubar Commands 85
Migration Tool Window 79
Options > Advanced... 86
overview 9, 73, 139
Post-transfer processing 88
Preparation of Storage Units 10, 15
Pre-transfer processing 88
Process 90
Purpose 76
Select Database dialog box 97
Stage Legacy Data 89
staging area 87
staging area (post transfer) 89
Staging area password 99
Staging area user 99
Start Data Transfer 90
Transfer data 88
Transfer of Data for Multiple Databases 105
Transfer steps 88
Data Migration Automatic mode 76
Data Migration procedure 94
Data Migration Toolkit 1
Data Transfer Preparation 74
Database Connections 82
DIMS 1, 73, 115, 116
Mapping Set 159
DIMS Custom Configuration Migration 106
DIMS pre-transfer preparation - QA 75
DIMS Storage Units 79
DIMS Wells 89
Drilling Data Migration 2
Drilling Field Mapping 1
DST Flow Rates and Flow Period Redesign 16
Duplicate Business Object Field 120
Duplicate Field 125

E

EDM Data Merging 115
EDM database 73
EDM Database Connection dialog box 124
Data Migration Data Migration Tool
EDM Database Connection dialog box 94
EDM Database Section 53
Ensure all Sidetrack Records are Numbered and Assigned a Parent Sidetrack 44
Ensure all Wells belonging to the Same Platform or Pad can be Grouped Together 28
Ensure Casing and Wellbore Equipment components picklist in EDM match the DIMS Component Group Name 45
Ensure Consistent Measurement Points in Datums and Correct Reference Depth Elevations 34
Ensure Kick-Off Dates for Sidetracks are Complete and Correct 32
Ensure Offshore Wells are Marked with the Offshore Flag 28
Ensure Perforated Assembly Name Has a Value that Matches one of the Assemblies in the Well if possible 29
Ensure Pool Names and Formation Names are Consistent 30
Ensure RDL Flags are Removed for RDL the values DAILY.pitdepth and DAILY.pit_tvd 42
Ensure Start Dates and End Dates for Events are Complete and Correct 32
Ensure Support Craft Items are Consistent (Within a Given Well) 31
Ensure that All Wells were Entered with the Same Reporting Standard and Using the Same Reporting Time 29
Ensure that the Last Casing/Next Casing Size Records are Valid and Consistent from Day-to-Day within an Event 33
Ensure that the new DIMS SYSINFO Parameters Being Used by the Migration Toolkit are Present 42
Ensure the Personnel Records are Consistent (Within a Given Well and Event) 32
Export dialog box
Export the Mapping Set for Review 61
Export the Mapping Set for Review 61

F

FDD_UNIT_MEASURES Table 162
Field Mapping 49
Action > Exit 57
Action > Export 57
Active 55
Add Mappings to Mapping Set 67

Comments 55
Copy a Mapping Set 62
Create a New Mapping Set 65
EDM Database Connection dialog box 59
Export the Mapping Set for Review 61
From value 54
Group Name 55
Link Tables 55
Main Menubar Commands 57
Mapped 54
Mapping Properties Section 53
Options > Scripts... 57, 58
Overview 49
Purpose 51
Remove Mappings from a Mapping Set 69
Rename a Mapping Set 63
Run Post-Transfer SQL Scripts 71
Run Pre-Transfer SQL Scripts 70
Select Application dialog box 60
Select value 54
using 52
View > Mapped Tables Only 57
View Current Mapping Set 59
Where value 54
Field Mapping Procedures 59
Field Mapping Tool
EDM Database Section 53
Field Mapping Tool Window 52
Field Mapping window
View Current Mapping Set 61
From value 56
From value field name 54

G

Grant DBA Role to the EDM User 155
Grant Roles to the Staging Area User 155
Group Like Bulk Products Together 26
Group Like Mud Products Together 26
Group Name field name 55

I

Identify Any Bits Not Associated with a BHA 25
Identify Orphan Data 17
Interactive mode 76
issues 7

K

known issues 7

L

Legacy Files 137
Link Tables 55
From value 56
Select value 56
Where value 56
link tables
Data Migration
link tables 87
link tables (post transfer) 89
Log 84
Look for Blank or Invalid Keys in DAYCOST 43

M

Main Menubar Commands 57
Data Migration 85
Mapped field name 54
Mapping of field 1
Mapping Properties Section 53
Mapping Sets 79, 159
Overview 159, 161
mapping sets 49
Master Business Object Field 120
Master Field 125
Merge Button 121, 122
merge common business objects 118
Merging of data 1
Migrate DIMS Wells 89
Migrate Wells 89
Migration
DIMS Custom Configuration 106
Migration of data 1
Migration of DIMS Custom Configuration 106
Migration Sequence 6
migration steps 6
Migration Tool Window 79
Modifications to the DIMS Mapping Set 160
MSDE 157
Multiple database transfer 105

N

New window
Copy a Mapping Set 63
Create a New Mapping Set 66

O

ODBC DSN 59, 94, 97, 98, 124
Options > Advanced...
Data Migration 86

Options > Scripts... 57, 58, 68, 70, 71
Oracle 154
Orphan Data 17
Overview 9, 73, 139

P

Picklist Home 79
Picklist Table Owner 57
Post Migration Step
  COMPASS 139
Post-transfer processing 88
Preparation of Storage Units 10
Pre-transfer processing 88
Procedure Data Merging Tool 124
procedure Data Migration 94
process Data Migration 90
Purpose 116
  Data Migration 76
purpose, Field Mapping 51

Q

Qualifying Source Table Prefix 79
Qualifying Source Table Suffix 79

R

Remove Mappings from a Mapping Set 69
Rename a Mapping Set 63
Rename window
  Rename a Mapping Set 64
Run Post-Transfer SQL Scripts 71
Run Pre-Transfer SQL Scripts 70

S

Select Database dialog box
  Data Migration 97
  Data Migration Data Migration
    Select Database dialog box 97
Select value 56
Select value field name 54
sequence 6
Stage Legacy Data 89
Staging Area 87
staging area 87
staging area (post transfer) 89
Staging area password 99
Staging area user 99
Start Data Transfer 90
Steps for DIMS Data - Pre-Migration 15
Steps for DIMS pre-migration
  Clean Up BHAs 23
steps to migration 6
StressCheck 1, 116, 159
Support Locations 201

T

Transfer data 88
Transfer of Data for Multiple Databases 105
Transfer steps 88
Tubular applications 2, 116

U

UMS_SYS_UNIT_MEASURES Table 179
Unit Conversion Tables 161
Using
  Data Migration 79
Using Data Merge Tool 119
Using Data Migration 79
Using Field Mapping 52

V

View Current Mapping Set 59

W

Website Addresses 206
Well Coordinates Comparison 140
WELLPLAN 1, 73, 115, 116, 159
Where value 56
Where value field name 54