



PPDM™

PROFESSIONAL PETROLEUM
DATA MANAGEMENT ASSOCIATION

PPDM COMPLIANCE

VENDOR NAME: ENERGYIQ

PRODUCT NAME: TRUSTED DATA MANAGER (TDM)

VERSION: 2.0

MEASUREMENT DATE: 5/31/13

PPDM COMPLIANCE SCORE

SCORE: V3.8 - 446:288:285 GOLD 94%

CREATED BY

Name:

Geordie Sinclair

Position:

Systems Administrator

Date:

5/31/13

VERIFIED AND AUTHORIZED BY

Name:

Stephen Cooper

Position:

President

Date:

9/12/2013

PRODUCT DESCRIPTION

Product Description EIQ Trusted Data Manager (TDM)

EnergyIQ's Trusted Data Manager (TDM) provides the platform for E&P companies to establish and maintain a trusted data store based on the industry standard PPDM data model. TDM is comprised of the following fully integrated web based components:

I. **EIQ Loader**

Automate the loading and blending of well, production, and log data from multiple data sources. Data is populated according to PPDM-defined best practices and standards specified by industry workgroups including:

- What is a Well?
- Well status and classification
- Reference code transformations and aliasing

Commercial Data: The EIQ Loader populates the PPDM data model with E&P data from IHS, Drillinginfo and TGS:

- Daily pre-permit and permit data
- Daily well data including drilling, completion, treatment, and testing activity
- Daily, weekly, and monthly state production data
- Production data is pivoted through the PVLoader to deliver aggregated data in a format that can be more easily consumed by calling applications

Generic Data: The EIQ Generic Loader provides a sophisticated interface to allow proprietary and third party data to be mapped and loaded into the trusted data store. The Generic Loader tool is delivered with out-of-the-box mappings for:

- TGS log data (digital and raster)
- TGS directional survey data
- Well data objects (including logs and directional surveys)
- Production data objects

II. **EIQ Query**

The EIQ Query tool is a sophisticated web based interface that enables users to quickly retrieve the information that they need through a comprehensive and configurable set of query parameters. The EIQ Query tool provides users with the ability to save and share

queries and results for enhanced collaboration. Integration with other TDM components allows results sets to be used to generate reports, exports, browse lists, edit data, and a number of other system outputs and views.

III. **EIQ Edit**

The EIQ Edit application provides an intuitive web based interface that allows users to create new records and edit existing data within the data store. The same UI components can be called from any application so that, for example, a user could select a well on a map and then call up the screen to add formation picks or view and edit test information.

The Edit application provides full support for versioning so that multiple records for the same well (with a different source value) can be blended together using sophisticated source preference rules. The result is a trusted version of the data that is presented to the end user based upon rules established by the business.

Edits to the data are captured within the PPDM Audit tables so that the history of changes to individual records within the database can be monitored and reviewed.

IV. **EIQ Admin**

The EIQ Admin application provides a sophisticated set of tools to manage the overall application to those users with assigned privileges. The functionality includes:

- Reference table management – create, edit and delete records and build a cross-reference list between reference values
- Manage the Source Preference List – establish the priority order in which attributes are promoted to the trusted version based upon source
- Review detailed results of load jobs processed against the database for trouble shooting purposes
- Master Data Management for critical support tables including aliasing, cross-referencing, add, edit and delete:
 - Business Associates
 - Formations
- Management of the Area type values and the hierarchical relationships between tables through the Area Contain module

v. **EIQ Reports**

EIQ Reports enables users to call E&P industry standard reports from any application, fully leveraging their data investment. EIQ Reports is a powerful and flexible Web Service reporting solution that helps you design, develop, and deliver reports directly to your enterprise applications. EIQ Reports is fully integrated within TDM so that reports can be called from all applications within TDM as well as from external applications. With EIQ Reports, you can:

- a. Run industry standard reports. This includes Scout Tickets, Full Well Report, Formation Picks, Production Summary and Production Detail.
- b. Call reports from any application. EIQ Reports is implemented as a Web Service that can be called from any application providing users with access to the most trusted data in a standard format.
- c. See the results in multiple formats. E&P Information is displayed in reports, spreadsheets, graphs, and HTML. You can also export results to Excel™ to perform additional analysis.
- d. Combine data from multiple data stores. EIQ Reports can access data across disparate data stores, combining data into a single report, and leveraging your data investment and strategy.
- e. Easily customize reports. EIQ Reports consist of modules configured to run against a target data store. You can easily curate custom reports by joining modules, even if they pull data from different data stores.
- f. Handle complex E&P data relationships. Sophisticated data mapping within EIQ Reports handles this complexity without sacrificing reliability or performance.

VI. **EIQ Rules**

The EIQ Rules application provides a sophisticated UI that allows users to create data quality rules against the PPDM data model instantiating the PPDM Business Rules content. Rules can be grouped together into Sets, and then scheduled to run against the full database or a subset of the database by applying a filter. Results can be displayed in detail or aggregated to present historical trends with time.

All Rules are developed in standard SQL and generate a Quality Index that provides a quantitative measure of quality for a data set (object) within the data store.

UNDERLYING TECHNOLOGY

Database and version supported:

SQL Server 2008 & 2012, Oracle 10g & 11g

Operating System supported:

Windows Server 2008 or 2012

Other as appropriate:

Application Server: IIS 7 with APS .Net version 4, Internet Explorer 8, 9 & 10, Firefox 14 or higher

COMPLIANCE TYPE

- This product connects directly to the tables and columns in a physical PPDM database via SQL (Gold Compliance)
- This product connects to a PPDM database by views or other connecting technology (Silver Compliance)

PRODUCT COMPLIANCE DETAILS

Version of PPDM supported	3.8
Footprint: Which PPDM modules does your product reference?	<p>Business Modules:</p> <ul style="list-style-type: none"> • <u>FIELDS</u> • <u>POOLS</u> • <u>PRODUCTION ENTITIES</u> • <u>RECORDS MANAGEMENT</u> • <u>SAMPLES AND ANALYSIS</u> • <u>STRATIGRAPHY</u> • <u>WELLS (incl. LOGS and DIRECTIONAL SURVEYS)</u> <p>Support Modules</p> <ul style="list-style-type: none"> • <u>AREAS</u> • <u>BUSINESS ASSOCIATES</u> • <u>COORDINATE SYSTEMS</u> • <u>PPDM DATA MANAGEMENT</u> • <u>PPDM UNITS OF MEASURE</u> • <u>REFERENCE TABLES</u>



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Product Scope: Number of tables or views implemented or referenced in the product, including tables that are not included in the PPDM data model.	446
Footprint: Number of tables or views that map to PPDM table definitions. On a separate document (using the DETAIL template provided), please list the names of the tables used.	288
Compliance: Have the Primary Keys of any PPDM tables been modified or dropped? If any, indicate on the DETAIL document.	NO
Compliance: Have any columns from any PPDM tables been removed or modified in any way? If any, indicate on the DETAIL document.	YES
Compliance: Have parent tables for any tables used by your product been dropped from your footprint? Please list if yes.	NO
Compliance: Do any additional tables or columns created for your product affect the PK of an existing PPDM Table?	NO
Compliance: Do any additional tables or columns created for your product create mandatory relationships in PPDM tables?	NO



PRODUCT DETAILS

TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
AREA				
AREA_CONTAIN				
BUSINESS_ASSOCIATE				
CS_COORDINATE_SYSTEM				
CS_ELLIPSOID				
CS_GEODETTIC_DATUM				
CS_PRIME_MERIDIAN				
CS_PRINCIPAL_MERIDIAN				
FIELD				
LEGAL_CARTER_LOC				
LEGAL_CONGRESS_LOC				
LEGAL_LOC_REMARK				
LEGAL_NE_LOC				
LEGAL_OFFSHORE_LOC				
LEGAL_OHIO_LOC				
LEGAL_Texas_LOC				
PDEN				



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TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
PDEN_IN_AREA				
PDEN_LEASE_UNIT			PDENLU_PLU_FK	
PDEN_PROD_STRING				STRING_ID Allowable Extension
PDEN_VOL_SUMMARY				
POOL				
PPDM_MEASUREMENT_SYSTEM				
PPDM_QUANTITY				
PPDM_UNIT_OF_MEASURE				
PROD_STRING				STRING_ID GOVERNMENT_STRING_ID Allowable Extension
PRODUCT				
R_ACTIVITY_TYPE				
R_ADDITIVE_TYPE				
R_ADDRESS_TYPE				
R_AIR_GAS_CODE				
R_ALIAS_REASON_TYPE				
R_ALIAS_TYPE				
R_ANALYSIS_PROPERTY				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_ANALYSIS_REPORT				
R_AOF_CALC_METHOD				
R_API_LOG_SYSTEM				
R_AREA_TYPE				
R_BA_CATEGORY				
R_BA_CONTACT_LOC_TYPE				
R_BA_CREW_TYPE				
R_BA_ORGANIZATION_TYPE				
R_BA_PERMIT_TYPE				
R_BA_SERVICE_TYPE				
R_BA_STATUS				
R_BA_TYPE				
R_BHP_METHOD				
R_BIT_REASON_PULLED				
R_BLOWOUT_FLUID				
R_BUILDUP_RADIUS_TYPE				
R_CEMENT_TYPE				
R_CHECKSHOT_SRVY_TYPE				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_CLIMATE				
R_COMPLETION_METHOD				
R_COMPLETION_STATUS				
R_COMPLETION_STATUS_TYPE				
R_COMPLETION_TYPE				
R_CONDITION_TYPE				
R_CONFIDENTIAL_TYPE				
R_CONFORMITY_RELATION				
R_CONT_STATUS				
R_CONT_TYPE				
R_COORD_QUALITY				
R_COORD_SYSTEM_TYPE				
R_CORE_HANDLING				
R_CORE_SAMPLE_TYPE				
R_CORE_TYPE				
R_CURVE_TYPE				
R_CURVE_XREF_TYPE				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_CUSHION_TYPE				
R_DATA_STORE_TYPE				
R_DATUM_ORIGIN				
R_DIGITAL_FORMAT				
R_DIGITAL_OUTPUT				
R_DIR_SRVY_CLASS				
R_DIR_SRVY_COMPUTE				
R_DIR_SRVY_POINT_TYPE				
R_DIR_SRVY_RECORD				
R_DIR_SRVY_TYPE				
R_DIST_REF_PT				
R_DOC_STATUS				
R_DOCUMENT_TYPE				
R_DRILL_BIT_TYPE				
R_DRILL_TOOL_TYPE				
R_DRILLING_MEDIA				
R_ENHANCED_REC_TYPE				
R_EW_DIRECTION				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_EW_START_LINE				
R_FACILITY_TYPE				
R_FAULT_TYPE				
R_FIELD_TYPE				
R_FLUID_TYPE				
R_FOOTAGE_ORIGIN				
R_HORIZ_DRILL_REASON				
R_HORIZ_DRILL_TYPE				
R_ITEM_CATEGORY				
R_ITEM_SUB_CATEGORY				
R_LAND_LESSOR_TYPE				
R_LANGUAGE				
R_LEGAL_SURVEY_TYPE				
R_LINER_TYPE				
R_LITHOLOGY				
R_LOCATION_DESC_TYPE				
R_LOCATION_QUALIFIER				
R_LOCATION_QUALITY				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_LOCATION_TYPE				
R_LOG_CRV_CLASS_SYSTEM				
R_LOG_DEPTH_TYPE				
R_LOG_DIRECTION				
R_LOG_GOOD_VALUE_TYPE				
R_LOG_INDEX_TYPE				
R_LOG_TOOL_TYPE				
R_LOST_MATERIAL_TYPE				
R_MEASURE_TECHNIQUE				
R_MEASUREMENT_TYPE				
R_MEDIA_TYPE				
R_MISC_DATA_TYPE				
R_MONTH				
R_MUD_SAMPLE_TYPE				
R_MUNICIPALITY				
R_NODE_POSITION				
R_NORTH				
R_NS_DIRECTION				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_NS_START_LINE				
R_OFFSHORE_AREA_CODE				
R_OFFSHORE_COMP_TYPE				
R_OIL_TYPE				
R_OPERAND_QUALIFIER				
R_PAYZONE_TYPE				
R_PDEN_STATUS				
R_PDEN_STATUS_TYPE				
R_PERFORATION_METHOD				
R_PERFORATION_TYPE				
R_PERIOD_TYPE				
R_PHYSICAL_ITEM_STATUS				
R_PICK_LOCATION				
R_PICK_QUALIFIER				
R_PICK_QUALITY				
R_PLATFORM_TYPE				
R_PLOT_SYMBOL				
R_PLUG_TYPE				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_POOL_STATUS				
R_POOL_TYPE				
R_POROSITY_TYPE				
R_PPDM_ROW_QUALITY				
R_PROD_STRING_TYPE				
R_PRODUCTION_METHOD				
R_PROJECTION_TYPE				
R_PROPPANT_TYPE				
R_PUBLICATION_NAME				
R_QUALITY				
R_RECORDER_POSITION				
R_RECORDER_TYPE				
R_REMARK_TYPE				
R_REPEAT_STRAT_TYPE				
R_RIG_CODE				
R_RIG_TYPE				
R_ROCK_CLASS_SCHEME				
R_SALINITY_TYPE				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_SAMPLE_LOCATION				
R_SAMPLE_TYPE				
R_SAMPLE_WATER_TYPE				
R_SECTION_TYPE				
R_SERVICE_QUALITY				
R_SEVERITY				
R_SHOW_TYPE				
R_SHUTIN_PRESS_TYPE				
R_SOURCE				
R_SP_POINT_VERSION_TYPE				
R_STATUS_GROUP				
R_STORE_STATUS				
R_STRAT_INTERP_METHOD				
R_SW_APPLICATION				
R_TAX_CREDIT_CODE				
R_TEST_EQUIPMENT				
R_TEST_PERIOD_TYPE				
R_TEST_RECOV_METHOD				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_TEST_RESULT				
R_TEST_SHUTOFF_TYPE				
R_TEST_SUBTYPE				
R_TOUR_OCCURRENCE_TYPE				
R_TREATMENT_FLUID				
R_TREATMENT_TYPE				
R_TUBING_TYPE				
R_VOLUME_METHOD				
R_WATER_BOTTOM_ZONE				
R_WATER_DATUM				
R_WATER_TYPE				
R_WELL_ACTIVITY_COMP_TYPE				
R_WELL_CLASS				
R_WELL_DATUM_TYPE				
R_WELL_LEVEL_TYPE				
R_WELL_LOG_CLASS				
R_WELL_PROFILE_TYPE				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
R_WELL_RELATIONSHIP				
R_WELL_STATUS				
R_WELL_STATUS_TYPE				
R_WELL_TEST_TYPE				
RM_DATA_CONTENT				
RM_DATA_STORE				
RM_DATA_STORE_HIER				
RM_DATA_STORE_HIER_LEVEL				
RM_DOCUMENT				
RM_INFO_ITEM_CONTENT				STRING_ID Allowable Extension
RM_INFORMATION_ITEM				
RM_PHYSICAL_ITEM				
RM_WELL_LOG				
SAMPLE_ANAL_COMPONENT				STRING_ID Allowable Extension
SAMPLE_ANALYSIS				
SAMPLE_GAS_ANAL_DETAIL				
SAMPLE_GAS_ANALYSIS				



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TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
SAMPLE_OIL_ANALYSIS				
SAMPLE_OIL_VISCOSITY				
SAMPLE_WATER_ANALYSIS				
SF_SUPPORT_FACILITY				
SOURCE_DOCUMENT				
STRAT_NAME_SET				
STRAT_UNIT				
STRAT_WELL_SECTION				
WELL				
WELL_ALIAS				
WELL_AREA				
WELL_CEMENT				
WELL_COMPLETION				
WELL_CORE			WCR_CK4	
WELL_CORE_DESCRIPTION				
WELL_DIR_SRVY				
WELL_DIR_SRVY_STATION				
WELL_HORIZ_DRILL				



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TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
WELL_LICENSE				
WELL_LOG				
WELL_LOG_AXIS_COORD				
WELL_LOG_CLASS				
WELL_LOG_CRV_CLS_XREF				
WELL_LOG_CURVE				
WELL_LOG_CURVE_AXIS				
WELL_LOG_CURVE_CLASS				
WELL_LOG_CURVE_FRAME				
WELL_LOG_CURVE_PROC				
WELL_LOG_DICT_ALIAS				
WELL_LOG_DICT_BA				
WELL_LOG_DICT_CRV_CLS				
WELL_LOG_DICT_CURVE				
WELL_LOG_DICT_PARM				
WELL_LOG_DICT_PARM_VAL				
WELL_LOG_DICT_PROC				
WELL_LOG_DICTIONARY				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
WELL_LOG_JOB				
WELL_LOG_PARM				
WELL_LOG_PARM_CLASS				
WELL_LOG_PASS				
WELL_LOG_TRIP				
WELL_LOG_TRIP_REMARK				
WELL_MUD_SAMPLE				
WELL_NODE				
WELL_NODE_VERSION				
WELL_PERFORATION				
WELL_PLUGBACK				
WELL_POROUS_INTERVAL				
WELL_PRESSURE				PROD_STRING_ID Allowable Extension
WELL_PRESSURE_AOF				
WELL_PRESSURE_AOF_4PT				
WELL_PRESSURE_BH				
WELL_REMARK				



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TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
WELL_SHOW				
WELL_SHOW_REMARK				
WELL_STATUS				
WELL_TEST				PROD_STRING_ID Allowable Extension
WELL_TEST_ANALYSIS				
WELL_TEST_FLOW				
WELL_TEST_FLOW_MEAS				
WELL_TEST_MUD				
WELL_TEST_PERIOD				
WELL_TEST_PRESSURE				
WELL_TEST_RECORDER			WTR_CK1	
WELL_TEST_RECOVERY				
WELL_TEST_REMARK				
WELL_TEST_SHUTOFF				
WELL_TREATMENT				TREATMENT_AMOUNT PROPPANT_AGENT_MESH_SIZE Allowable Extension
WELL_TUBULAR				
WELL_VERSION				



TABLE NAME	COLUMN NAME	PK ALTERED	FK ALTERED	COLUMN ALTERED
Z_PDEN_VOL_BY_MONTH				
Z_R_COUNTRY				
Z_R_COUNTY				
Z_R_DISTRICT				
Z_R_GEOGRAPHIC_REGION				
Z_R_GEOLOGIC_PROVINCE				
Z_R_PROVINCE_STATE				

CONGRUENCE MEASUREMENT

TABLE NAME: PDEN_LEASE_UNIT

Characteristics	Value	Formula	Comment	Score
Table Name	25	1	Table name is the same	25
Primary Key	25	1	Primary Key components are the same	25
Foreign Keys	25	25/3	1 foreign key altered PDENLU_PL_FK	17
Columns	25	25/4n	All columns (name, format, length, null-ability) are the same	25
TOTAL				92

TABLE NAME: WELL_TEST_RECORDER

Characteristics	Value	Formula	Comment	Score
Table Name	25	1	Table name is the same	25
Primary Key	25	1	Primary Key components are the same	25
Foreign Keys	25	25/4	1 foreign key altered WTR_CK1	19
Columns	25	25/4n	All columns (name, format, length, null-ability) are the same	25
TOTAL				94



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TABLE NAME: WELL_CORE

Characteristics	Value	Formula	Comment	Score
Table Name	25	1	Table name is the same	25
Primary Key	25	1	Primary Key components are the same	25
Foreign Keys	25	25/8	1 foreign key altered WCR_CK4	22
Columns	25	25/4n	All columns (name, format, length, null-ability) are the same	25
TOTAL				97

COMPANY VERIFICATION

I, Leanna Gallagher hereby verify that the information provided in this document provides a true and complete representation of the information required for a PPDM Compliance Measurement, has been created by persons with sufficient technical knowledge, and has been verified and authorized by an officer or appointed designate of the Company.

CREATED BY

Name: Leanna Gallagher

Position: Sr Data Analyst

Date: 6/12/2013

VERIFIED AND AUTHORIZED BY

Name: Steve Cooper

Position: President

Date: 9/12/2013

Stephen M. Cooper