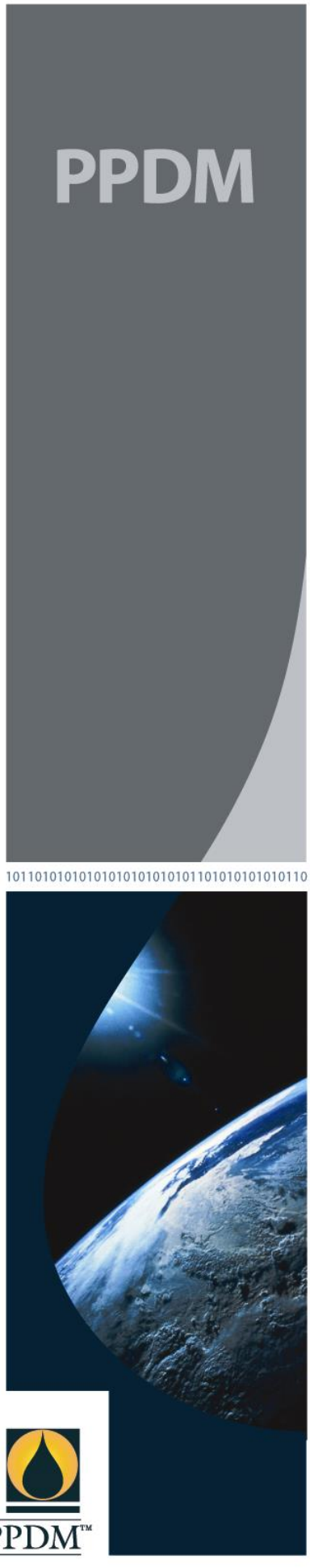
PPDM Association

Restrictions

Reference Guide

Last updated for PPDM 3.7



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About This Document

This reference guide has been prepared to help managers, analysts, DBAs, programmers, data managers, and users understand how the Data Model is intended to be used. Readers at many levels, from managerial to technical implementers will benefit from reading this document. General, high-level business information is contained at the beginning of the document, with each section becoming progressively more technical and detailed.

Sometimes the terms we use in this and other PPDM documents need to be defined. We provide definitions in a separate Glossary, which you can obtain from PPDM.

This reference guide contains the following sections:

- Introduction

  Provides an executive overview of the PPDM Model as it pertains to Restrictions.

- Business Process Overview

  Summarizes Restrictions and provides examples of related business processes.

- Integration

  Discusses the integration of restrictions with the other PPDM Business Modules and provides information about related references guides.

- Model Overview

  Includes the entity relationship diagram and discusses the use of Restrictions Module tables in the Data Model.

- Tables and Columns – Restrictions

  Identifies the data model tables for the Restrictions Module, what they contain, and how they should be used. This section is intended to be used in conjunction with the PPDM Table Report available for download from the PPDM Web Site (www.ppdm.org).

- Implementation Considerations

  Discusses issues related to implementing the PPDM model, architectural methodologies used in design, or special considerations for implementation that are not related to a specific table.

- Frequently Asked Questions

  Addresses technical and business questions about the Restrictions Module.

- Appendix A – Sample Queries

  Provides example queries with the appropriate SQL scripts that should assist in the query process when testing the accuracy of data stored in the module.

- Appendix B – Changes to the Model

  Identifies the changes in the Restrictions Module from the latest version to the newest release version of the PPDM model.

Introduction

The Restrictions module in PPDM version 3.7 supports environmental functions related to the administration of surface activities such as seismic exploration, drilling operations and facility construction. In its present form, the module allows users to capture descriptions of surface activities that are subject to legal, regulatory or contractual restrictions. These restrictions may be associated with contracts, land rights or other activities as is relevant.

In its present form the Restrictions module handles mostly regulatory restrictions of an environmental nature, such as bird sanctuaries, migration routes and fisheries grounds. Future developments are expected to increase its scope to cover any type of surface activity restriction, including those imposed by landowners. Development of a Health, Safety and Environment module, planned for future releases of PPDM, will integrate this information with new modules to support environmental assessment, management and reclamation.

Business Process Overview

Purpose

The Restrictions Module provides the means for a Business Associate to track contractual, statutory, and documented restrictions or limitations on activities that are defined in the terms and conditions of legal agreements, or legislated terms and conditions that are applicable to the use of property. A Business Associate is required to comply with the terms and conditions of the restriction.

Business Processes

Nearly every aspect of the Exploration and Production business requires access to the ground; obtaining and managing rights to the surface is a key business process that spans the entire life cycle of every E&P business object. This is self evident in land-based work; every field operation must be arranged with appropriate permission to access the necessary surface land. Marine operations share many requirements to ensure that their operations comply with environmental or other restrictions.

Restrictions are the limitations placed upon the use of surface lands (or the marine environment). Restrictions may be imposed through negotiations, contractual arrangements, legislation or regulation; in a single business operation, and Oil and Gas companies may need to manage many types of restrictions.

Some restrictions dictate the methods and equipment that may be used. For example, during winter field operations, you may be required to use wide tracked vehicles over marshy terrain. Other restrictions may dictate the time of year that operations are (or are not) permitted. In northern climates, field operations are normally restricted during the spring thaw, when the land is soft and susceptible to damage. Failure to comply with restrictions may jeopardize the validity of the terms and conditions of an agreement and could result in litigation and/or penalties.

Restrictions may be imposed at many stages of the E&P life cycle. The following hypothetical life cycle illustrates a few of the many types that could be encountered:

Business Process	**Restriction set by**	**Restrictions Imposed**
Preliminary seismic exploration	Regulatory agency	• Operations in winter only. • Wide tracked vehicles to be used
	Environmental agency	• No work near caribou migration route April - June
	Local residents	• Cultivated land crossing subject to conditions

Well drilling	Local ranchers	• Fences to be re-built • Grass to be re-seeded
	Regulatory agency	• Waste management • Crew locations • Abandonment criteria
Facility construction	Regulatory agency	• Emissions controls • Maintenance cycles
	Local residents	• Hours of operation • Emergency response plan

Restrictions that will be applied to a land right acquired from a government are usually known when the land right is posted for bidding. While many restrictions may be documented in the body of the land sale document, others may be associated with the geographic area in which operations are planned, or are enforced through legislation. Others are established in conjunction with local or indigenous residents through consultation when operations are proposed. In most cases, many information sources should be consulted to ensure that all restrictions have been identified.

Recording pertinent information about restrictions allows applications to support administration of any reporting or functional requirements. Particularly pertinent is information about the type of restriction, specific activities that are prohibited or restricted, dates or seasons that the restriction is in effect, and details about how to contact the appropriate enforcement agencies.

Some restrictions are time sensitive. For example, from September 15th to October 15th of each year, no entry can be obtained in certain areas because the Trumpeter Swans are breeding. It is the Operator's responsibility to ensure compliance with these restrictions. An agency such as a government body is responsible for the creation and enforcement of certain restrictions. Legislated or environmental restrictions are usually defined for a Geographic area—any land right that falls within the boundaries of a restricted area is subject to its provisions. Over time, regulators may modify the restrictions to some extent, so it is important to know which version of a restriction the land right is bound by. Often, a land right is subject to many different restrictions that are set by various agencies or regulatory bodies.

Administration of restricted areas is complex, both for the operators of the activity and for the responsible regulatory body. Specific details of a restriction often change over time, making it necessary for all parties to keep track of which version of a restriction each land right is bound by. Over time, as the lands covered by the land right change, it may be necessary to add or remove active associations with restrictions. However, since responsibility for reclamation activities can extend beyond the lifetime of actual operations in an area, it is usually necessary to maintain even outdated associations with restrictions.

Failure to comply with a restriction can have serious ramifications and may result in the loss of property access rights or severe financial penalties. If this occurs, a

Business Associate may suffer loss of the initial investment and any operational costs that were paid. Additional costs may also be incurred if failure to comply with restrictions results in litigation by another Business Associate affected by the error.

Integration

Integration is the key to managing the PPDM and its components properly. Information critical to managing seismic data throughout its life cycle is managed in many support and business modules in PPDM version 3.6:

Support Modules

AFE: Application for Expenditure or Cost Center. Capture information about the cost centers or AFE's used through the life cycle.

Areas: business, regional or project areas associated with data

Business Associates: track detailed information about partners, service providers and other people, companies and regulatory agencies that you do business with.

Entitlements: information about the rights that you have to any type of data and what you are able to do with it.

PPDM Units of Measure: capture the default stored unit of measure for any measured value in the database.

Work Order: captures requests for work to be completed with some summary information about what was done and the data affected by the work order.

Business Modules

BA Interest Sets: describe partnership information for the ownership of data and assets.

Contracts: contracts formed to manage relationships between business associates

Geodetic and spatial: use this module to reference any positional information to geodetic or cartographic information.

Land Rights: capture mineral or surface land rights.

Stratigraphy: make use of subsurface stratigraphic definitions that can be shared among all modules.

Obligations: especially useful to ensure that surface access requirements or conditions are met.

Projects: track work projects, such as for field acquisition, interpretation, or processing.

- Records Management: track the physical location of digital and hard copy products, circulation, retention, etc.
- Restriction: capture details about environmentally sensitive areas where access is limited.
- Support facility: describe facilities used to support business operations..
- Wells: describe well data.

Contact PPDM to inquire about the status and availability of reference guides for these modules.

Data Diagrams

The diagram on this page is the legend for the tables discussed later in this document. Note that some or all of these elements may be present in data diagrams provided by the Association. Some elements are removed from final products to reduce file size:

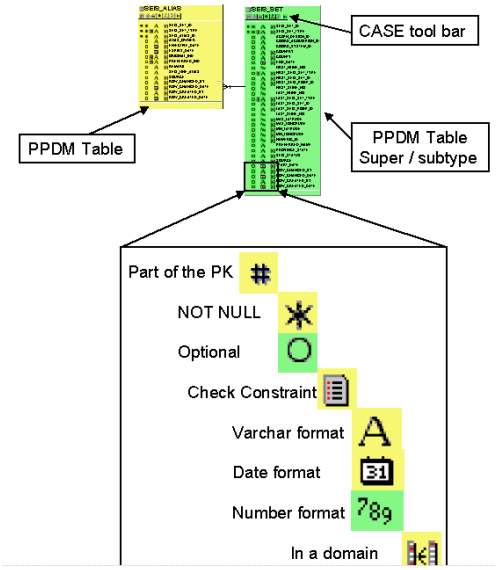

Figure 6: *This illustration shows the functions of each icon used in the data diagrams provided with PPDM version 3.7.*

The data diagrams for the Module are not provided in this reference guide because of their very large file size. Data diagrams can be obtained from the PPDM Association as part of the final model documentation or as a set of PowerPoint diagrams. The PowerPoint diagrams will provide the best resolution for printed quality.

Tables and Columns: Restrictions

The following tables exist in the Restrictions module of PPDM version 3.7. Each table is described in the following section; you can jump to a table description by clicking on the hyper linked table name below. Note that for detailed content descriptions for each table, you should refer to the PPDM version 3.7 table documentation.

RESTRICTION

This table describes surface restrictions of various sorts, as defined and enforced by a jurisdictional body such as a government or its agency. Detailed information about the surface restriction, such as its areal extent, restricted activities, contact information and descriptions can be found in the associated tables.

Use RESTRICTION_VERSION to keep track of the details about the restriction as it changes over time. As changes are made, it will be necessary to determine whether the land rights associated with the restriction are subject to the conditions specified in the old version, the new version, or both versions. The ACTIVE_FLAG should be used to highlight versions of the restrictions that are currently active. It may not be uncommon for many versions of the restriction to be active at any given time.

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REST_ACTIVITY

This table captures the activities that are restricted for this restriction. Some restrictions are permanent and others are seasonal.

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REST_CLASS

This allows you to capture the type or category of surface restriction classification. Often a regulatory body sets these classifications. For example, bird sanctuaries in Alberta are assigned the Class code “BSA”.

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REST_CONTACT

This table provides a list of valid contacts for the land surface restriction. Contact information may be changed over time, and the current primary contact flagged. Each contact is a BUSINESS_ASSOCIATE in PPDM. Information about phone numbers, addresses, fax numbers, and so on can be obtained through the BA_CONTACT_INFO table.

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REST_REMARK

This table contains general remarks about the land surface restriction. Remarks may be codified for standardization if desired, and the codes associated with the restriction via REMARK_CODE. Long remarks that span more than one row may be sequenced using the RESTRICTION_REMARK_SEQ_NO column.

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REST_TEXT

This table stores the text of the land restriction document, as provided by the regulatory agency or board. The SEQ_NO is used to order rows for retrieval.

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LAND_RIGHT_REST

This cross-reference table identifies what version of each restriction is applied to a specific Land Right.

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LAND_RIGHT_REST_REM

This table contains narrative remarks about a land restriction, as it is applied to a land right. Long remarks that span more than one row may be sequenced using

the RESTRICTION_REMARK_SEQ_NO column. The REMARK_TYPE column may be used to classify the type of remark made.

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LAND_SALE_RESTRICTION

This cross-reference table identifies what restrictions are applied to a specific land sale offering.

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LAND_SALE_REST_REMARK

This table contains narrative remarks about a land restriction as it is applied to a land sale. Long remarks that span more than one row may be sequenced using the RESTRICTION_REMARK_SEQ_NO column. The REMARK_TYPE column may be used to classify the type of remark made.

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SPATIAL_DESCRIPTION

This table stores the surface and subsurface description of a parcel of land. The surface description may be stated in terms of a legal survey system, metes and bounds, or polygon. The mineral zone is not necessary for the restrictions module, as restrictions usually apply to surfaces only. Note that GIS queries may be used to advantage in this module, as they can effectively determine what restricted areas overlap which land rights.

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Implementation Considerations

Constraints in PPDM

Starting with version 3.3, PPDM has enforced referential integrity through the use of constraints. The improper use of constraints when adding, changing, or deleting information in the database may have a profound impact on your data.

For example, PPDM has implemented many *multi-component constraints*. In these cases, *all* columns that comprise the constraint must be populated for the constraint to fire. If only some of the columns are populated, the constraint will not fire and corrupt data will enter the database undetected.

For more information about the use of constraints in PPDM, refer to the PPDM Constraints User Guide.

Check Constraints

PPDM makes use of check constraints in rare cases where the values that may be input for a column are known at design time and will not change over time. Two types of uses are observed in PPDM.

- Where the column name is %_IND, the column is an indicator field, and the values may only be Y, N, or null.
- Super-sub type implementations use check constraints to enforce the integrity of the super-sub type relationship. Currently these relationships are in use for PDEN and LAND_RIGHT.

  Let's use LAND_RIGHT as an example. This structure consists of a parent table (LAND_RIGHT) and five sub-type tables (LAND_TITLE, LAND_AGREEMENT, LAND_AGREE_PART, LAND_UNIT and LAND_UNIT_TRACT). Each of the six tables has a two-part primary key: LAND_RIGHT_ID and LAND_RIGHT_TYPE.

  LAND_RIGHT_ID is assigned by the user and can have any value as long as it is unique for that LAND_RIGHT_TYPE. LAND_RIGHT_TYPE was designed to maintain the integrity of the super-sub type structure and can only have the values assigned to it by check constraints; these values are the table names of the valid sub-types. In LAND_RIGHT, the LAND_RIGHT_TYPE can have any of the five table names, but in each of the sub-types, it can only have the name of the table it is owned by.

Use of Stratigraphic Units in PPDM

The Stratigraphy Module is widely referenced in PPDM for identification of subsurface events, activities, granted rights, interpretation, and more. Throughout the Well and Production Modules, the stratigraphic unit is often provided by data vendors "as reported" to a regulatory body or agency. The Land and Contracts Modules make use of the Stratigraphy Module to define subsurface areas where permission to explore or produce has been granted for exploration activities or where an agreement is to be upheld.

Audit Columns

Each table contains five columns: SOURCE, ROW_CHANGED_BY, ROW_CHANGED_DATE, ROW_CREATED_BY, and ROW_CHANGED_DATE. These columns satisfy a data auditing requirement to identify the user and date of database transactions.

Use the “CREATED” columns when you are inserting new data rows and the “CHANGED” columns when you are updating a data row. The ROW_CHANGED/CREATED_BY columns are usually populated using the system login id in use. ROW_CHANGED/CREATED_DATE is usually set to the system date of the insert or update operation. For the SOURCE column, specify where you obtained the data from. If you receive the data from Vendor A, and Vendor A received the data from Regulatory B, you should set the SOURCE to Vendor A. In some cases (such as for interpreted picks), data is created by an application. In this case, the source may be set to identify the application that created the data.

ACTIVE_IND

Most tables in the Land, Contracts, Interest Sets, Restrictions and Obligations modules contain a column called ACTIVE_IND. The values for this column may be one of Y, N, or null. Maintaining information about how a business object has changed over time is an important business requirement for all these modules. To support this, mechanisms for allowing versioning have been added to many tables.

When more than one row has been created for a business object, use the ACTIVE_IND to indicate the row that is currently active. This provides implementers with two benefits. First, when populating EFFECTIVE_DATE and EXPIRY_DATE it will not be necessary to populate EXPIRY_DATE with a false future date to indicate that the row of data has not expired yet. Second, queries can explicitly search only for rows that are active.

If this column is used for queries, as recommended (such as “find me the currently active status for this land right”), you should implement procedures to ensure that this column is always populated as either Y or N and maintained appropriately. If the column is left blank (called NULL), the query will not be consistent or reliable.

One way to populate this column would be to default the value to N if the expiry date is filled in and has already happened. Make it Y if the expiry date is empty *or* if the expiry date contains a future date.

Frequently Asked Questions (FAQ)

How would I know what restrictions apply to Crown Vacant lands?

The aerial extent of each restriction can be captured using the SPATIAL_DESCRIPTION table and its subordinates. By comparing these spatial descriptions to the locations of Crown Vacant Lands, a correlation can be found. It should be noted that this type of query is best handled by a GIS application. If you wish to store these relationships explicitly, you can use SP_DESC_XREF.

Where would I store the source of the restriction?

The document that describes the restriction can be filed in a library as paper, film, or digital media. The document itself is defined in PPDM using SOURCE_DOCUMENT. The RECORDS MANAGEMENT module in PPDM captures the location of this document.

If a restriction is legislated, how would I find out who to contact for certain restrictions for a certain municipality?

The REST_CONTACT table will provide this information.

I have obtained a land right through the land bidding process. At the bid level, the regulatory board notified me about the restrictions imposed on the lands. How do I associate the new land right with the restrictions I placed in LAND_SALE_RESTRICTION during the acquisition process?

The restrictions that you placed in LAND_SALE_RESTRICTION should now be associated with the LAND_RIGHT. Do this by copying the restrictions in LAND_SALE_RESTRICTION to LAND_RIGHT_REST.

Appendix A: Sample Queries

These sample queries have been developed based on a subset of the requirements defined and captured in the Business Requirements Document. Inevitably, there are as many ways to address the question that is asked as there are—we have tried to provide one useful example for your reference. Our intention is to give you some examples that illustrate use of the model.

Overall, there are a few fundamental issues related to queries that are relevant to nearly every Business Area:

- **Spatial or GIS queries:** Spatial queries are not thoroughly addressed in this section of the reference guide; how you deal with those depends on the spatial engine you are using. In many cases, we have avoided using spatial queries because the number of query lines needed obscures the rest of the query and makes it more difficult to read. Sometimes, we have provided a connection to a NAMED AREA rather than a lat/long box.
- **Versioning over time:** Many aspects of the Oil and Gas business have a strong time component. Users require information about how a business object was configured in the past, what it looks like now, and what it is expected to look like in the future (i.e., who were my partners in 1995, who are they now, and who will they be in 2005). If your queries need to address the situation as it is now, use the ACTIVE_IND you will find in many versioned table. This will help ensure that you do not return data that is out of date.

What surface restrictions are currently in effect in a geographic area?

```
select     R.RESTRICTION_ID, R.RESTRICTION_VERSION, R.ACTIVE_IND,
           R.EFFECTIVE_DATE, R.END_DATE, R.END_DATE_EVENT,
           R.EXPIRY_DATE, R.RESTRICTION_CLASS, R.START_DATE,
           R.START_DATE_EVENT
  from     RESTRICTION R, SPATIAL_DESCRIPTION SD, AREA A,
           SP_COMPONENT SC
 where     R.RESTRICTION_ID  =  SC.RESTRICTION_ID
   and     R.RESTRICTION_VERSION  =  SC.RESTRICTION_VERSION
   and     SC.SPATIAL_DESCRIPTION_ID = SD.SPATIAL_DESCRIPTION_ID
   and     SC.SPATIAL_OBS_NO  =  SD.SPATIAL_OBS_NO
   and     (((AREA_MIN_LATITUDE BETWEEN FIRST_LATITUDE AND
           SECOND_LATITUDE)
   and     (AREA_MIN_LONGITUDE BETWEEN SECOND_LONGITUDE AND
           FIRST_LONGITUDE))
    or     ((AREA_MAX_LATITUDE BETWEEN FIRST_LATITUDE AND
           SECOND_LATITUDE)
   and     (AREA_MAX_LONGITUDE BETWEEN SECOND_LONGITUDE AND
           FIRST_LONGITUDE)))
```

```
   and      UPPER(R.ACTIVE_IND)    =    'Y'
```

Comments: AREA may mean an AREA_ID as defined in the AREA table or just a physical area. This SQL is written assuming the first. To do the second, the AREA table must be dropped, and the query changed to look for lat/longs within the lat/longs of the LLD. Alternatively, this query could be constructed to check LEGAL_DLS_LOC for s specific set of parcels.

Are there any current environmental restrictions that will affect my operations in this area?

```
select      R.RESTRICTION_ID, R.RESTRICTION_VERSION,
            RA.ACTIVE_IND, RA.EFFECTIVE_DATE,
            RA.EXPIRY_DATE, RA.RESTRICTED_ACTIVITY
  from      REST_ACTIVITY RA, RESTRICTION R, SPATIAL_DESCRIPTION
            SD, AREA A, SP_COMPONENT SC
 where      R.RESTRICTION_ID  =  SC.RESTRICTION_ID
   and      R.RESTRICTION_VERSION  =  SC.RESTRICTION_VERSION
   and      RA.RESTRICTION_ID  =  R.RESTRICTION_ID
   and      RA.RESTRICTION_VERSION  =  R.RESTRICTION_VERSION
   and      SD.SPATIAL_DESCRIPTION_ID = SC.SPATIAL_DESCRIPTION_ID
   and      SD.SPATIAL_OBS_NO  =  SC.SPATIAL_OBS_NO
   and      (((AREA_MIN_LATITUDE BETWEEN FIRST_LATITUDE AND
            SECOND_LATITUDE)
   and      (AREA_MIN_LONGITUDE BETWEEN SECOND_LONGITUDE AND
            FIRST_LONGITUDE))
    or      ((AREA_MAX_LATITUDE BETWEEN FIRST_LATITUDE AND
            SECOND_LATITUDE)
   and      (AREA_MAX_LONGITUDE BETWEEN SECOND_LONGITUDE AND
            FIRST_LONGITUDE)))
   and      UPPER(R.ACTIVE_IND)    =    'Y'
```

What is the geographic area covered by the lease (SK014824)?

```
select      LA.LAND_RIGHT_ID, SPB.POINT_SEQ_NO, SPB.LATITUDE,
            SPB.LONGITUDE
  from      LAND_AGREEMENT LA, SPATIAL_DESCRIPTION SD,
            SP_POLYGON SPPOL, SP_BOUNDARY SPB, SP_COMPONENT SPCOM
 where      LA.LAND_RIGHT_ID  =  SPCOM.LAND_RIGHT_ID
   and      LA.LAND_RIGHT_TYPE  =  SPCOM.LAND_RIGHT_TYPE
   and      SD.SPATIAL_DESCRIPTION_ID = SPCOM.SPATIAL_DESCRIPTION_ID
   and      SD.SPATIAL_OBS_NO = SPCOM.SPATIAL_OBS_NO
   and      SPCOM.SPATIAL_DESCRIPTION_ID = SPPOL.SPATIAL_DESCRIPTION_ID
   and      SPCOM.SPATIAL_OBS_NO  =  SPPOL.SPATIAL_OBS_NO
   and      SPPOL.POLYGON_ID  =  SPB.POLYGON_ID
   and      SPCOM.LAND_RIGHT_ID   =   'SK014824'
```

Comments: We have chosen to report the latitude and longitude points of the polygons here. Alternatively, you could report legal parcel definitions or the spatial description in text form.

Appendix B: Changes to the Model

The PPDM Association has made a concerted effort to reduce the impact of new model development on members who are using other versions of PPDM. However, any new development is accompanied by some changes. Arriving at a model that is sufficiently detailed to meet the business needs of every member and yet flexible or abstract enough to be shielded from the corporate or regulatory variations is complex, but achievable. Every attempt is made to ensure the model complies with, but is relatively independent, of specific jurisdictional requirements. Changes in government policy, regulations or structure may at time invalidate portions of the model. Internal re-engineering business process in industry companies may impact business requirements, which drive the data model. Rapid technological changes may also affect the model structure.

This section identifies all applicable changes from the latest version to the newest release version to assist the members in an ease of transition to implement the latest version of the PPDM model.

Changes Between Versions 3.4 and 3.5

PPDM contained a single table with little detail to capture restrictions. Most of the model represents new development for version 3.5.

The Business Requirements that provided the impetus for model growth were documented by the work groups (Land and Stratigraphy) during the Business requirements gathering phase of development. The Business Requirements Document is available to members of the association.

For a detailed enumeration of changes, additions, and deletions, refer to the Data Mapping document, provided with the PPDM 3.5 release documentation.

Changes between Versions 3.5 and 3.6

This module was not changed in PPDM version 3.6

Changes between Versions 3.6 and 3.7

Table names were modified to set the restrictions module apart from the land module. The prefix LAND_ was dropped from most table names. Refer to the detailed mapping for more information.