



Affidavit of Sean Nelson Costello

WAD 37 of 2022

Federal Court of Australia

District Registry: Western Australia

Division: General

YINDJIBARNDI NGURRA ABORIGINAL CORPORATION RNTBC

Applicant

STATE OF WESTERN AUSTRALIA & ORS

Respondents

Affidavit of: **Sean Nelson Costello**

Address: c/- Fortescue Metals Group, Level 2, 87 Adelaide Terrace, East Perth WA
6004

Occupation: Geospatial Analyst

Date: 30 June 2023

Filed on behalf of (name & role of party)

Prepared by (name of person/lawyer)

Law firm (if applicable)

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Company Pty Ltd, Pilbara Gas Pipeline Pty Ltd and The Pilbara Infrastructure
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I, Sean Nelson Costello, c/- Fortescue Metals Group, Level 2, 87 Adelaide Terrace, East Perth WA 6004, geospatial analyst, make oath and say as follows:


1. I am employed by FMG Personnel Services Pty Ltd, a subsidiary of Fortescue Metals Group Limited (**FMGL**) as Lead Geospatial Analyst. FMGL is the holding company of a number of related companies including the 2nd to 6th respondents (**FMG Respondents**) in this case (together **FMG**).
2. I am authorised to make this affidavit on behalf of the FMG Respondents.
3. Unless otherwise stated, the facts contained in this affidavit are within my own knowledge and are true.

Background

4. In 2014, I obtained a graduate diploma in geospatial information systems from Curtin University.
5. I commenced employment with FMGL in about November 2014 as a Geospatial Information System (**GIS**) officer, and have been working in the geospatial team since then. My role is to create and provide maps (Cartography) to various departments throughout FMG as required. I also perform a variety of spatial analysis tasks as part of my role.
6. There are two GIS teams, the services team (where I work) and the data team. The data team works on the acquisition and verification of the GIS data (as I explain below). I work on the services side utilising the GIS data to perform geospatial analysis tasks, and to prepare maps.

Geographic information systems (GIS) and FMG's systems

7. A geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on Earth's surface. FMG uses various GIS software suites to create, acquire and manage spatial data, as well as to perform geospatial analysis and generate cartographical outputs (maps).
8. Spatial (or locational) data consists of coordinates for a location on the earth's surface. Spatial data can also contain additional information (metadata). For example, stating what is at the location, identifying physical items or characteristics of a location (such



as size or length), or providing links to relevant reports relating to the spatial entity. Spatial data can exist in one of two formats. The first is known as raster, which is pixel based, such as an aerial image. The second format is known as vector, as explained further below - this format can contain the metadata mentioned above. Vector is made up of three geometry types, they are:

- (a) Point, which is one pairs coordinates for a single location. This is generally used to represent features such as bores or fire hydrant locations.
- (b) Line, which contains an array of coordinate pairs that make up a linear feature. This generally represents features such as roads or rivers.
- (c) Polygon, which is also an array of coordinate pairs, where the last pair matches the first to create a closed area. This geometry type is used to represent features such as tenements and pastoral stations.

9. FMG currently uses the software program Arcmap (by ESRI), and is transitioning to Arcpro. These programs are used to view, analyse, edit and create spatial data. They are also used to create the maps required by the business. The GIS data is either created, or obtained from various sources. Examples of this data include:

- (a) *Tenement data:* For tenement areas, the Department of Mines, Industry Regulation and Safety (DMIRS) has an online system that contains the location of all tenements spatially. The GIS team download the spatial data in the 'feature class' file format and add it to FMG's spatial database. This is done daily by a programmed script. The script populates the dataset and provides a report on any changes from the previous day. In some cases, the DMIRS data does not represent the true area held by a tenement. For example, a tenement may have excluded areas due to various other land holdings that are either current, or historical. The GIS team applies exclusions to the DMIRS data, to better represent the tenement areas that are held. A new dataset (feature class) is populated to store these altered tenements. This is also performed by a programmed script. The raw DMIRS data is left unaltered in a separate dataset, allowing the two to be compared in GIS software. FMG generated tenements, in some cases, are not a perfect representation of the area held. There are some unique exclusions that are not accounted for in the programmed script.



- (b) *Heritage data*: when heritage surveys are completed in the field, data is collected and provided to FMG for processing and recording. This includes spatial data containing the area surveys, as well as any heritage places found within the surveyed area. This data is also supplied in the feature class format. There is various metadata attached to the spatial data, containing information such as site or survey ID number, recorded date and the like. A member of the GIS team adds this information to its respective feature class in the database.
10. If FMG proposes to use an area of land for any purpose, including ground disturbance, FMG has a process by which the use of the land will be permitted only if a land use certificate (or LUC) is obtained. For this process, spatial boundaries for the proposed area of land use are created by FMG employees, so that internal approval for the specific land use can be obtained (a LUC). The spatial file containing the boundary is entered into FMG's tenement management system known as 'Infoscope'. Infoscope is integrated with a geospatial platform called 'Fortescue Maps', a user-friendly front-end system that allows people without geospatial skills to view spatial data. This enables the land in question to be analysed against other spatial datasets. These datasets contain various features, such as heritage sites, that may impact upon the area being applied for (that is, conflicts between features on the land and the application for use will be identified). The LUC boundary can be edited in Fortescue Maps to remove any conflicting areas, ensuring it's acceptable for approval by SMEs (subject matter experts) in departments such as heritage, environment and tenements. Once approved, a map and spatial data file is automatically generated for the LUC by Fortescue Maps. The spatial data and map of the LUC area is used by site personnel to define the area of approved land use, such as ground disturbance. The source data for Fortescue Maps comes from the spatial database that is managed by the GIS team.
11. Before LUCs were implemented in May 2017, FMG used Ground Disturbance Permits (GDPs). This was essentially the same process, however the checks and maps were done manually by a member of the GIS team, as opposed to the automated process performed by Fortescue Maps.

Maps

12. On 10 February 2023, I produced the following maps:



- (a) “Map A1 - Tenements held by the FMG Respondents in the Compensation Application Area”: I produced this map by using a “definition query”, which is a method of filtering spatial data from a single data source. This allows you to display the spatial data required, without having to create a separate file containing the relevant data. In this case, the definition query was used to only display tenements on the list provided to me, these are listed in the top left of the map. The Yindjibarndi Determination area / compensation application area is also displayed on the map. The Legend depicts the colouring for different categories of tenements as listed in the Legend. The Overview box provides context to the Yindjibarndi Determination in its entirety. The main map has the boundary of the Yindjibarndi Determination area in blue through the middle. Mining leases are depicted in red; exploration licences are depicted in green; prospecting licences are depicted in light blue and miscellaneous licences are depicted using different types of blue outlines, differentiating different tenement holders. The mining leases, exploration licenses and prospecting licences have, respectively, a red, green or light blue border and also have colour shading. A copy of Map A1 is attached and marked **SNC-1**.
- (b) Map A2 - Mining Leases held by the FMG Respondents in the Compensation Application Area: I produced this map by selecting only the mining leases from map A1 and overlaying the Yindjibarndi Determination area. A copy of Map A2 is attached and marked **SNC-2**.
- (c) Map A3 - Exploration and Prospecting Licences held by the FMG Respondents in the Compensation Application Area: I produced this map by selecting only the exploration and prospecting licences held by Fortescue and overlaying the Yindjibarndi Determination Area. The area of exploration licence 47/3205 appears to consist of several small areas; this is because its area has had exclusions applied, where another entity has rights. A copy of Map A3 is attached and marked **SNC-3**.
- (d) Map A4 – Miscellaneous Licences held by the FMG Respondents in the Compensation Application Area: I produced this map by selecting only the miscellaneous licences from the tenement list provided and overlaying the Yindjibarndi Determination Area. I have tried to best distinguish the FMG holders based on the size of their applications. I used darker blue for the smaller



applications, and becoming lighter as the tenement size increases. A copy of Map A4 is attached and marked **SNC-4**.

13. On 10 February 2023, I also produced a document titled Map B: Respondents' Infrastructure Map. That map shows the disturbance footprint for the Solomon Hub and overlays the tenement boundaries of tenements E47/1319, E47/1333, E47/1334, E47/1398, E47/1399, E47/1447, E47/3205, E47/3464, L1SA, L47/361, L47/362, L47/363, L47/367, L47/472, L47/697, L47/801, L47/813, L47/814, L47/859, L47/901, L47/914, L47/919, M47/1409, M47/1411, M47/1413, M47/1431, M47/1453, M47/1473, M47/1475, M47/1570 and P47/1945. A copy of Map B is attached and marked **SNC-5**.
14. The process for the collection of the data shown in that map was:
 - (a) FMG captures disturbance data for the purposes of providing annual reports. The disturbance data is obtained by quarterly aerial surveys carried out by a contractor. An aerial survey consists of a series of photos taken from either a plane, drone or a satellite which are "stitched together" to show a photographic image of the whole mine site.
 - (b) When the GIS team receives the quarterly aerial photographs, a member of the GIS services team uses this image to digitise polygon type spatial data, based on the newly disturbed areas identified in the image. These polygons are attributed with various information, such as type of disturbance, and other information such as the relevant approvals and tenement information. This information is verified annually by the FMG environment department, to correct any mistakes in the data before it is submitted to the relevant government agencies.
 - (c) I used the disturbance data based on the aerial image captured on 6 January 2023, which had been collected through the above processes. This data has been approved by the environment team, and matches what was submitted in the annual report.
 - (d) The labels displayed on the map are site localities that were requested to be displayed. The majority of this information could be located within FMG's spatial database, from my own working knowledge based on my years working on the Solomon Hub, or by checking mining proposals or asking employees with knowledge of the specific infrastructure.



- (e) In representing the disturbance on this map, I used as a basis the reporting categories for the Mining Rehabilitation Fund, which I understand are environmental reporting obligations under each tenement. However, where there were similar disturbances such as different categorisation of mine pits (above the water table (AWT) and below the water table (BWT)), I grouped those together as one category of mine pits. Where transport corridor is reported for the Mining Rehabilitation Fund, I broke it down into the categories of Water Pipeline, Access Road, Conveyor, Haul road, Rail, Powerline Infrastructure and Optic Fibre Cable to reflect accurately the disturbance. Each category of disturbance is depicted in the legend to the map, being:
- (i) Borefield;
 - (ii) Building or camp site;
 - (iii) Dam – fresh water;
 - (iv) Diversion Channel or Drain;
 - (v) Fuel Storage Facility;
 - (vi) Landfill Site;
 - (vii) Laydown or Hardstand Area;
 - (viii) Mine Pits;
 - (ix) Plant Site;
 - (x) ROM (being run of mine);
 - (xi) Tailings and Residue Storage Facility;
 - (xii) Waste Dump;
 - (xiii) Workshop;
 - (xiv) Water Pipeline, the disturbance area includes both the area covered by the pipeline and clearing and disturbance for the purposes of laying the pipe;



- (xv) Access Road;
- (xvi) Conveyor;
- (xvii) Haul Road;
- (xviii) Rail;
- (xix) Powerline Infrastructure;
- (xx) Optic Fibre Cable.

15. On 28 June 2023, I produced a further document titled “Map C: Reported Disturbances in the Solomon Mine Area”. To produce this Map C, I started with Map B mentioned above and I added further data and information to show the Solomon Mine development both within the compensation area and outside the compensation area. A copy of Map C is attached and marked **SNC-6**. Map B shows the Solomon Mine development only as it overlays with the compensation application area.

Sworn by Sean Nelson Costello
 at East Perth
 in the State of Western Australia
 on 30 June 2023

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 Signature of deponent

Before me:



 Signature of witness

a legal practitioner who has held a practice certificate for at least 2 years and who holds a current practice certificate.

“SNC-1”

WAD 37 of 2022

Federal Court of Australia

District Registry: Western Australia

Division: General

YINDJIBARNDI NGURRA ABORIGINAL CORPORATION RNTBC

Applicant

STATE OF WESTERN AUSTRALIA & ORS

Respondents

This is the annexure marked **SNC-1** referred to in the affidavit of Sean Nelson Costello sworn on 30 June 2023.



Signature of witness

a legal practitioner who has held a practice certificate for at least 2 years and who holds a current practice certificate.

“SNC-2”

WAD 37 of 2022

Federal Court of Australia

District Registry: Western Australia

Division: General

YINDJIBARNDI NGURRA ABORIGINAL CORPORATION RNTBC

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STATE OF WESTERN AUSTRALIA & ORS

Respondents

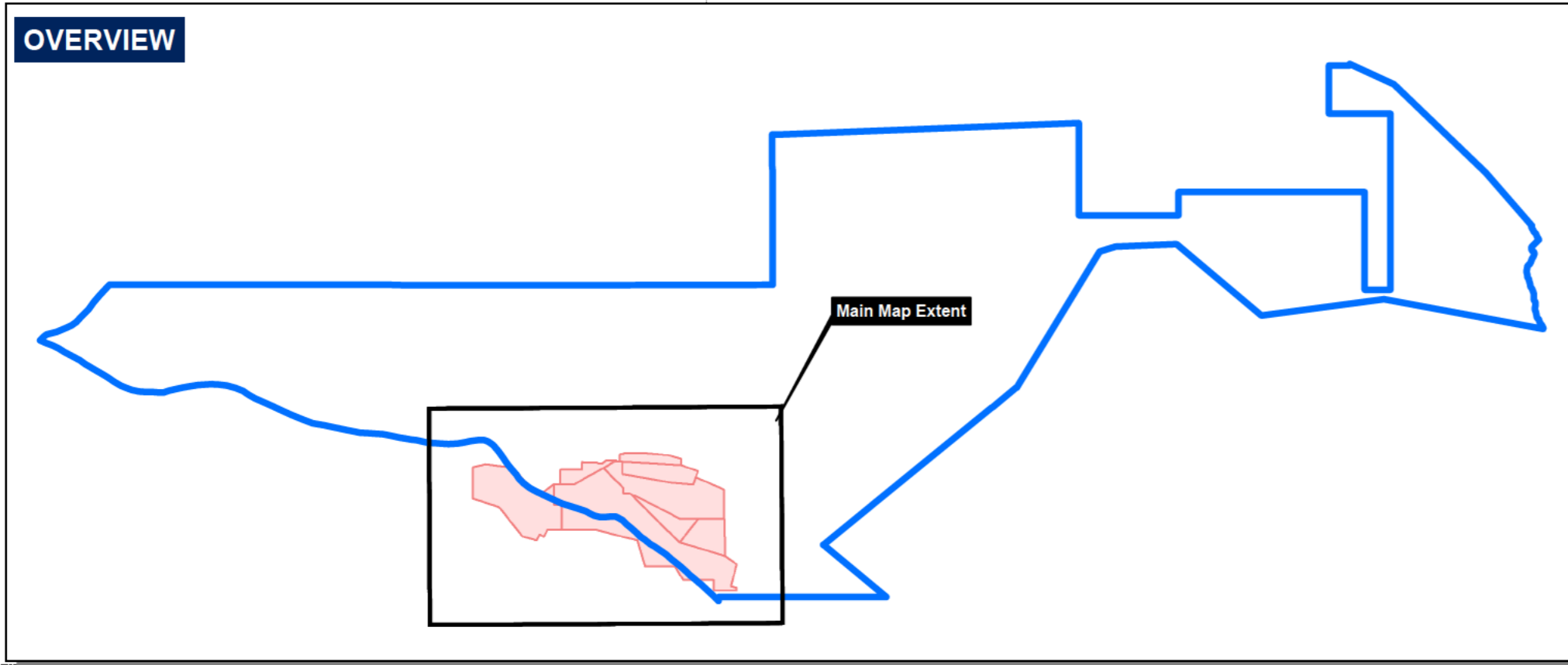
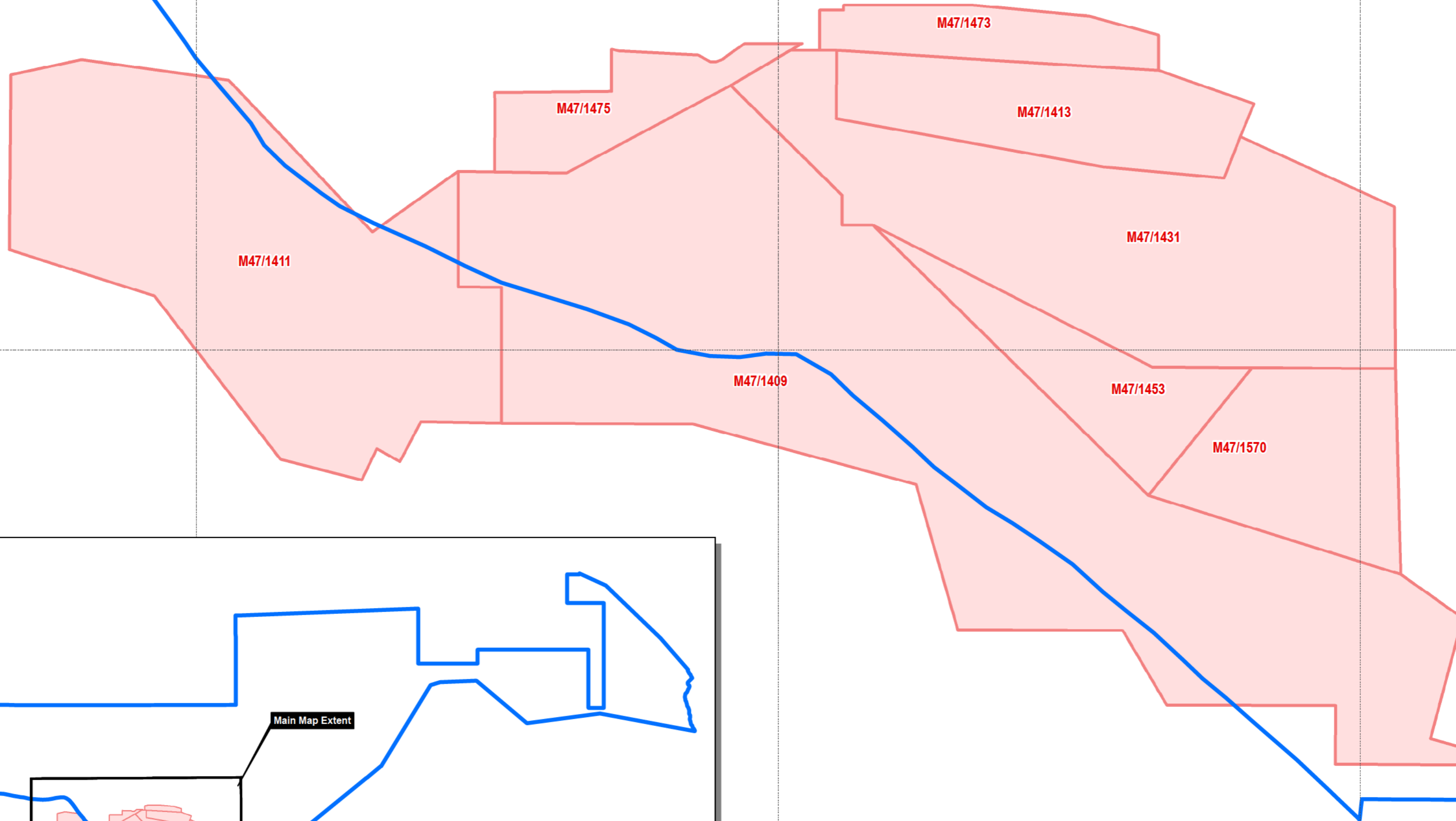
This is the annexure marked **SNC-2** referred to in the affidavit of Sean Nelson Costello sworn on 30 June 2023.



Signature of witness

a legal practitioner who has held a practice certificate for at least 2 years and who holds a current practice certificate.

Tenement	HOLDER	GRANTDATE	ENDDATE
M47/1409	FMG PILBARA PTY LTD	26/11/2010	25/11/2031
M47/1411	FMG PILBARA PTY LTD	26/11/2010	25/11/2031
M47/1413	FMG PILBARA PTY LTD	26/11/2010	25/11/2031
M47/1431	FMG PILBARA PTY LTD	8/07/2011	7/07/2032
M47/1453	FMG PILBARA PTY LTD	17/01/2013	16/01/2034
M47/1473	FMG PILBARA PTY LTD	29/08/2014	28/08/2035
M47/1475	FMG PILBARA PTY LTD	29/08/2014	28/08/2035
M47/1570	FMG PILBARA PTY LTD	31/03/2020	30/03/2041



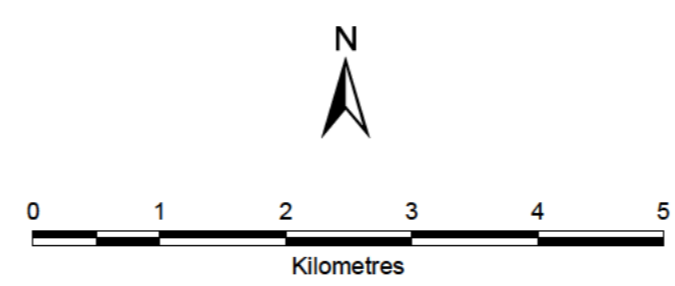
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- LEGEND**
- ▬ Yindjibarndi Determination Area
 - ▭ FMG Mining Leases



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 Document Name: 100_MP_OP_0159_018_r1
 Date: 10/02/2023
 Size: A2L

**Mining Leases held by the
 FMG Respondents in the
 Compensation Application Area
 Map "A2"**

“SNC-3”

WAD 37 of 2022

Federal Court of Australia

District Registry: Western Australia

Division: General

YINDJIBARNDI NGURRA ABORIGINAL CORPORATION RNTBC

Applicant

STATE OF WESTERN AUSTRALIA & ORS

Respondents

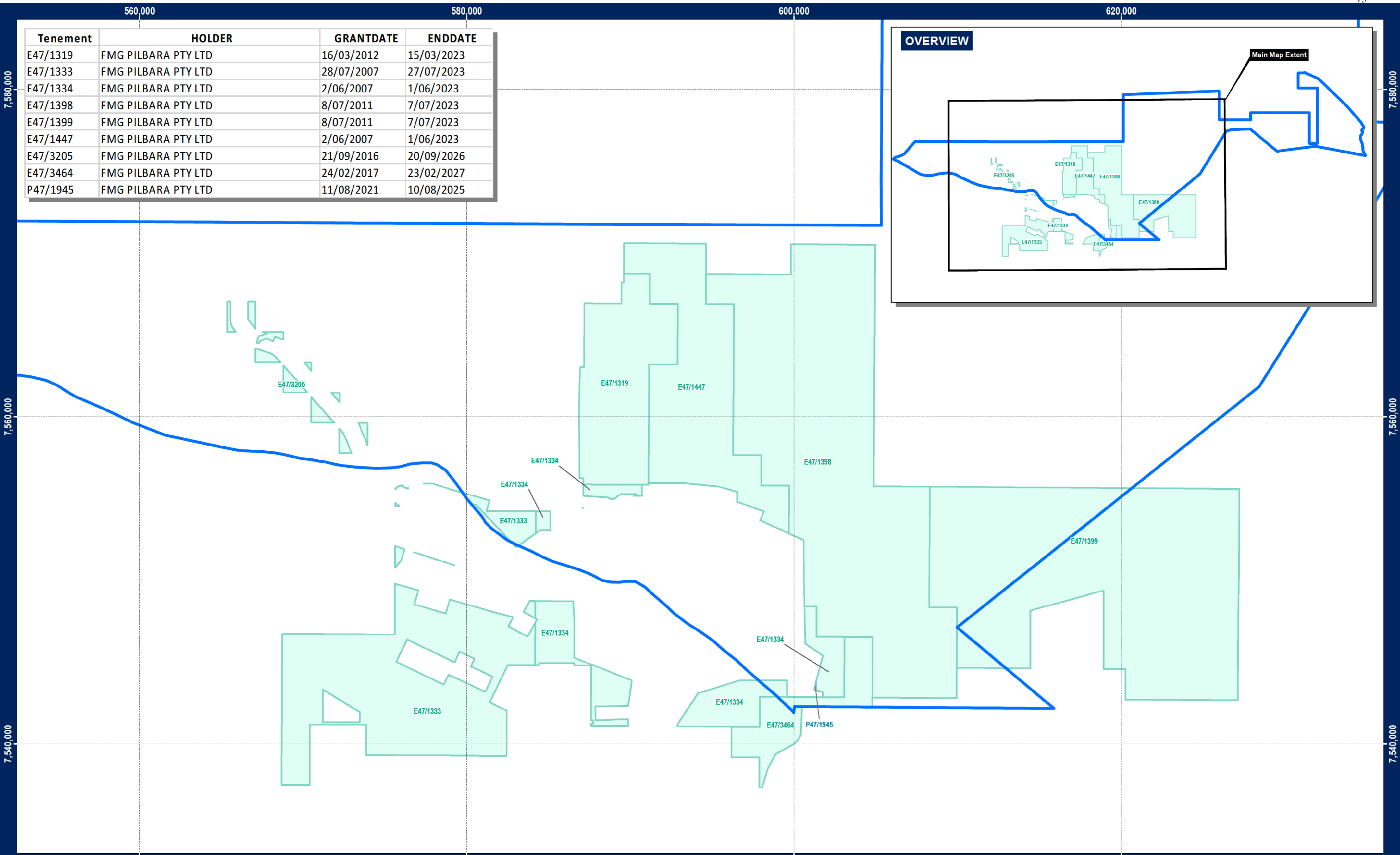
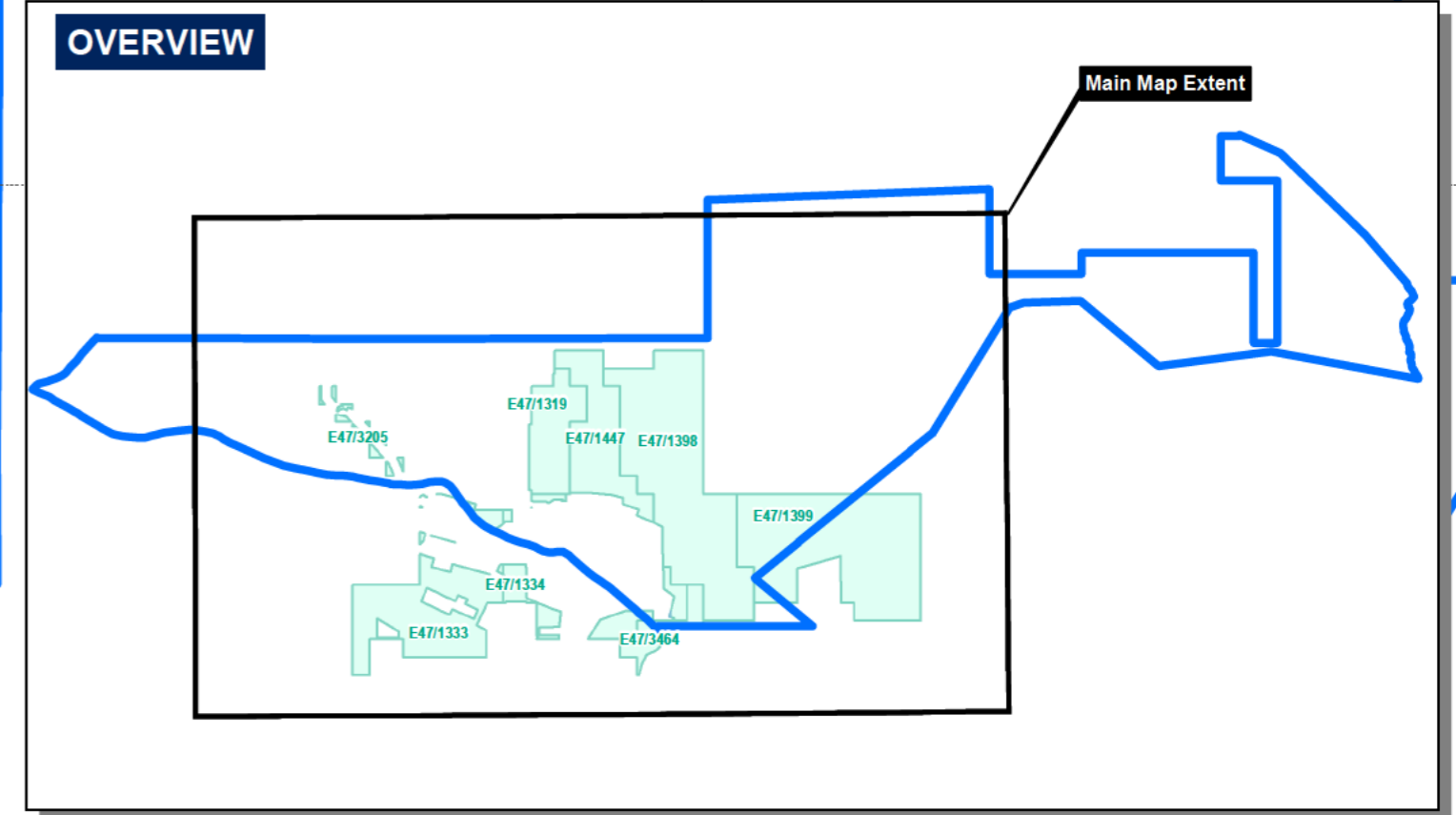
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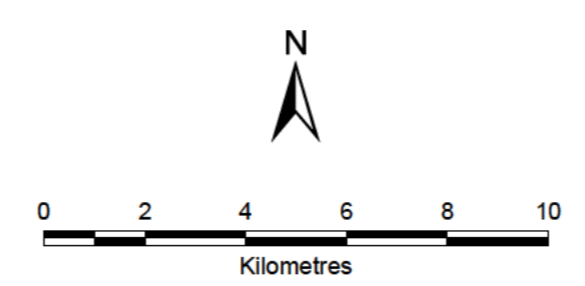
Signature of witness

a legal practitioner who has held a practice certificate for at least 2 years and who holds a current practice certificate.

Tenement	HOLDER	GRANTDATE	ENDDATE
E47/1319	FMG PILBARA PTY LTD	16/03/2012	15/03/2023
E47/1333	FMG PILBARA PTY LTD	28/07/2007	27/07/2023
E47/1334	FMG PILBARA PTY LTD	2/06/2007	1/06/2023
E47/1398	FMG PILBARA PTY LTD	8/07/2011	7/07/2023
E47/1399	FMG PILBARA PTY LTD	8/07/2011	7/07/2023
E47/1447	FMG PILBARA PTY LTD	2/06/2007	1/06/2023
E47/3205	FMG PILBARA PTY LTD	21/09/2016	20/09/2026
E47/3464	FMG PILBARA PTY LTD	24/02/2017	23/02/2027
P47/1945	FMG PILBARA PTY LTD	11/08/2021	10/08/2025



- LEGEND**
- ▭ Yindjibarndi Determination Area
 - ▭ FMG Exploration Licences
 - ▭ FMG Prospecting Licences



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 Size: A2L

Exploration and Prospecting Licences held by the FMG Respondents in the Compensation Application Area Map "A3"

“SNC-4”

WAD 37 of 2022

Federal Court of Australia

District Registry: Western Australia

Division: General

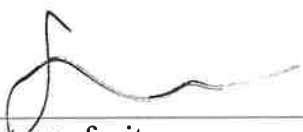
YINDJIBARNDI NGURRA ABORIGINAL CORPORATION RNTBC

Applicant

STATE OF WESTERN AUSTRALIA & ORS

Respondents

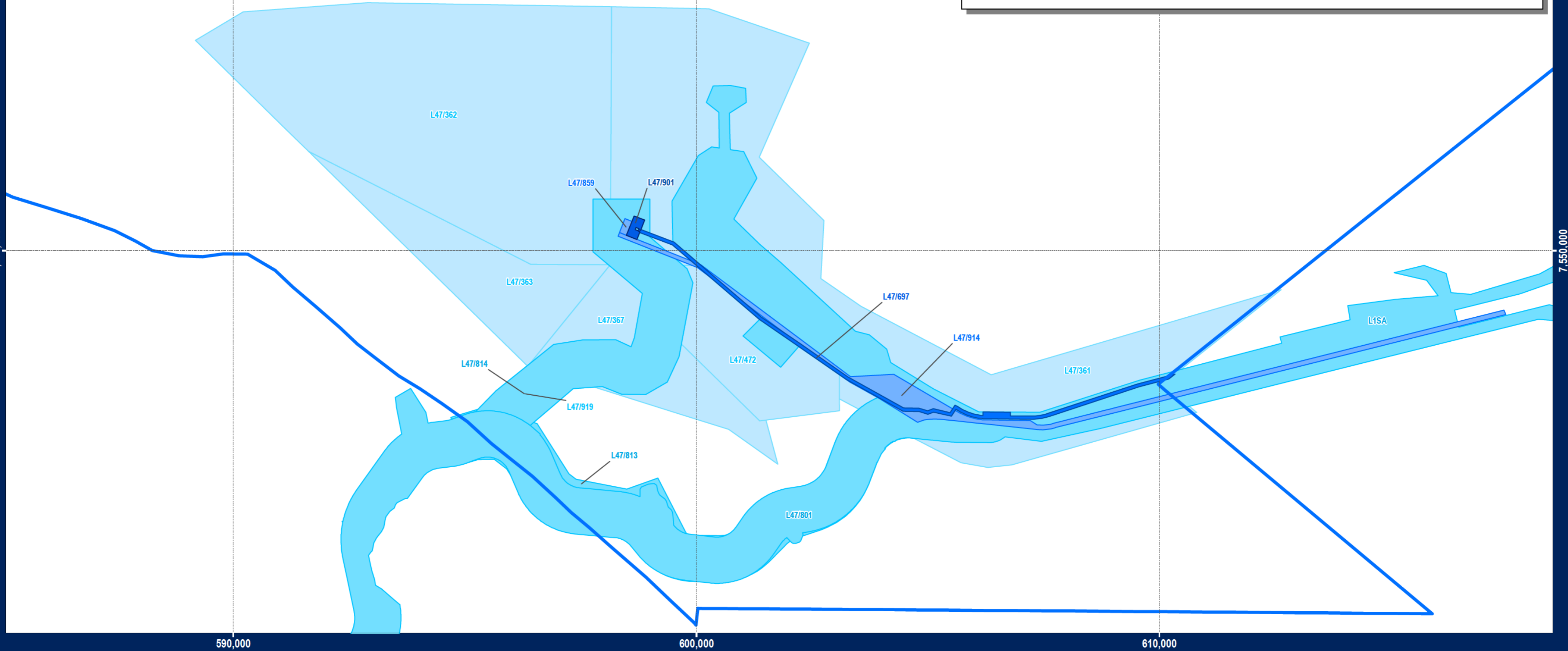
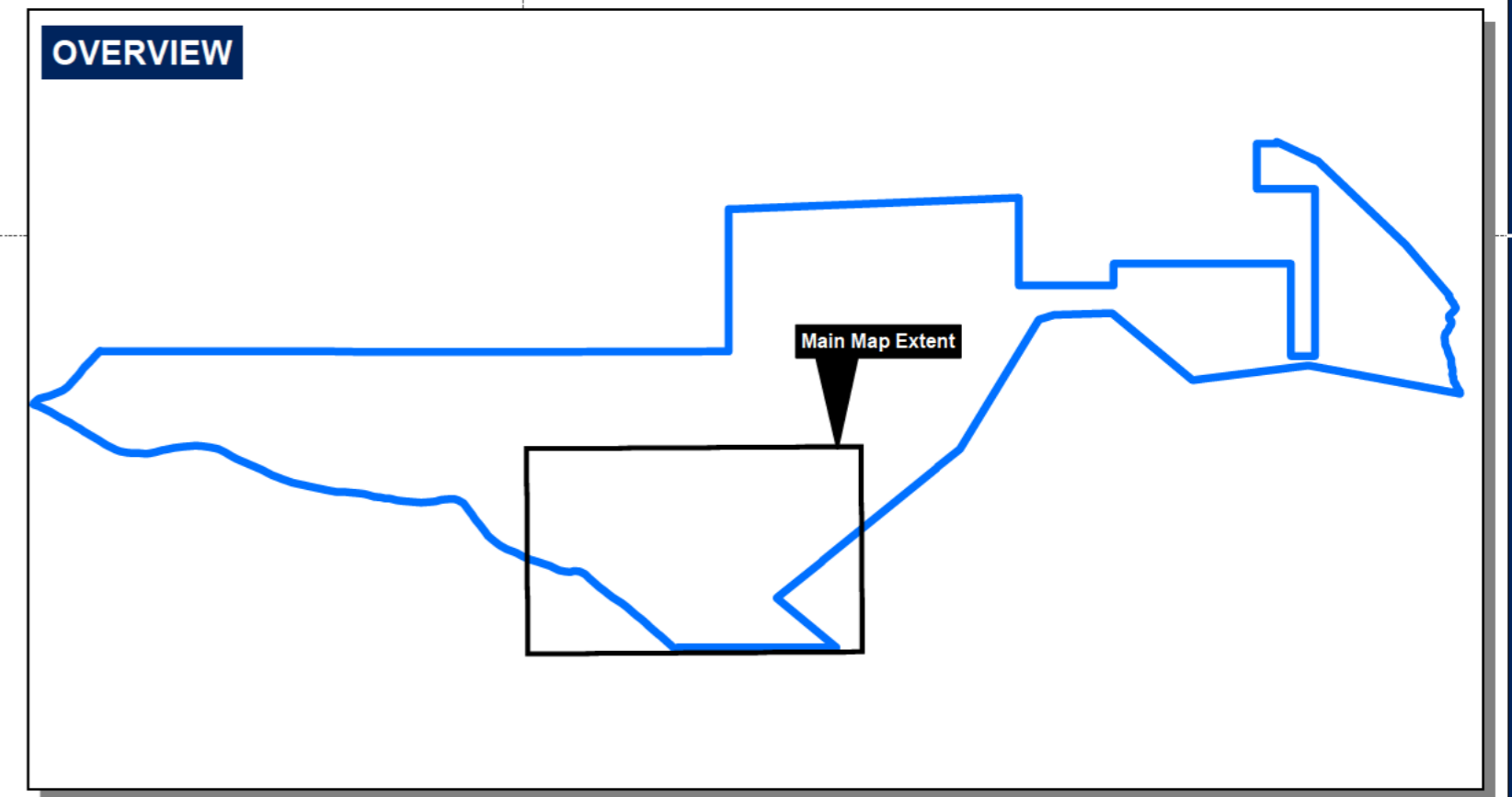
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Signature of witness

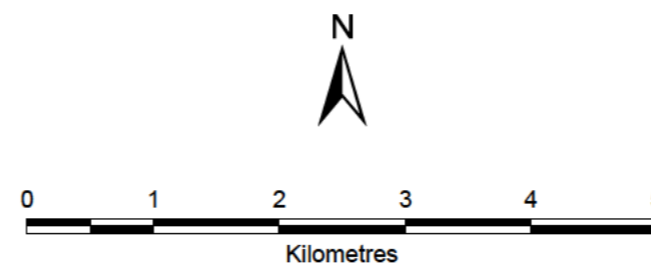
a legal practitioner who has held a practice certificate for at least 2 years and who holds a current practice certificate.

Tenement	HOLDER	GRANTDATE	ENDDATE
L1SA	THE PILBARA INFRASTRUCTURE PTY LTD	29/11/2006	28/11/2056
L47/361	FMG PILBARA PTY LTD	11/10/2011	10/10/2032
L47/362	FMG PILBARA PTY LTD	3/05/2011	2/05/2032
L47/363	FMG PILBARA PTY LTD	3/05/2011	2/05/2032
L47/367	FMG PILBARA PTY LTD	2/03/2012	1/03/2033
L47/472	FMG PILBARA PTY LTD	18/07/2014	17/07/2035
L47/697	PILBARA GAS PIPELINE PTY LTD	2/12/2013	1/12/2034
L47/801	THE PILBARA INFRASTRUCTURE PTY LTD	24/05/2019	23/05/2040
L47/813	THE PILBARA INFRASTRUCTURE PTY LTD	6/04/2018	5/04/2039
L47/814	THE PILBARA INFRASTRUCTURE PTY LTD	6/04/2018	5/04/2039
L47/859	PILBARA ENERGY COMPANY PTY LTD	6/02/2019	5/02/2040
L47/901	PILBARA ENERGY (GENERATION) PTY LTD	26/06/2019	25/06/2040
L47/914	PILBARA ENERGY COMPANY PTY LTD	15/11/2019	14/11/2040
L47/919	FMG PILBARA PTY LTD	10/01/2020	9/01/2041



LEGEND

- Yindjibarndi Determination Area
- FMG Misc. Licences**
- PILBARA ENERGY (GENERATION) PTY LTD
- PILBARA GAS PIPELINE PTY LTD
- PILBARA ENERGY COMPANY PTY LTD
- FMG PILBARA PTY LTD
- THE PILBARA INFRASTRUCTURE PTY LTD



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Miscellaneous Licences held by the FMG Respondents in the Compensation Application Area Map "A4"

“SNC-5”

WAD 37 of 2022

Federal Court of Australia

District Registry: Western Australia

Division: General

YINDJIBARNDI NGURRA ABORIGINAL CORPORATION RNTBC

Applicant

STATE OF WESTERN AUSTRALIA & ORS

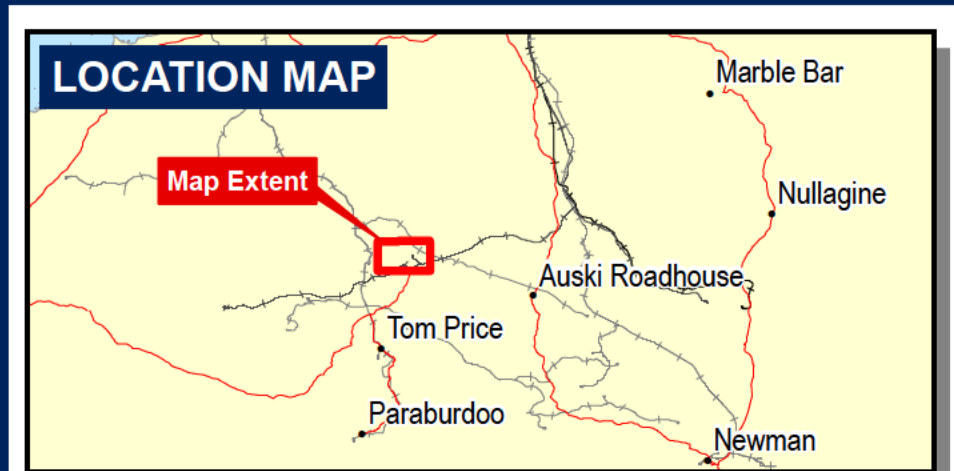
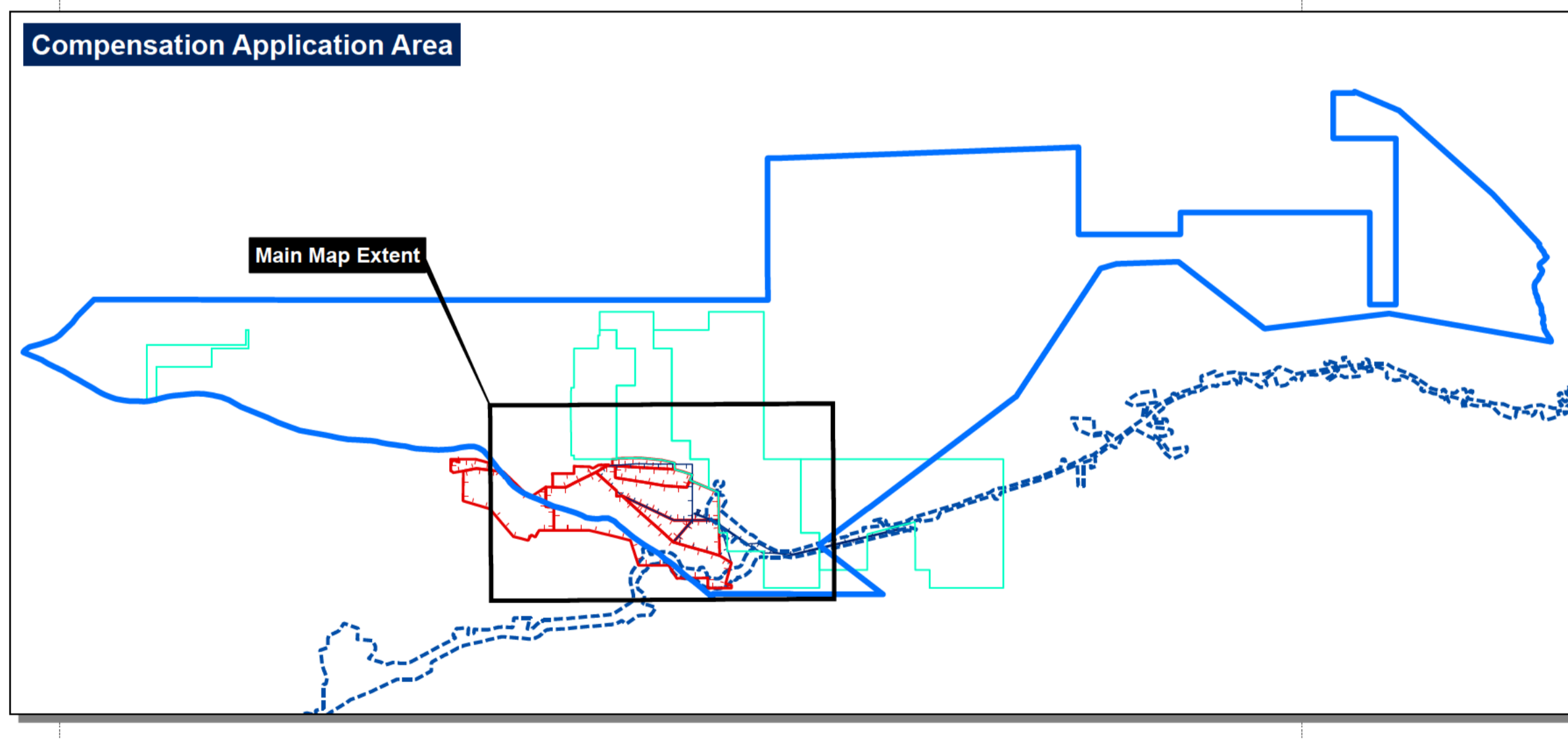
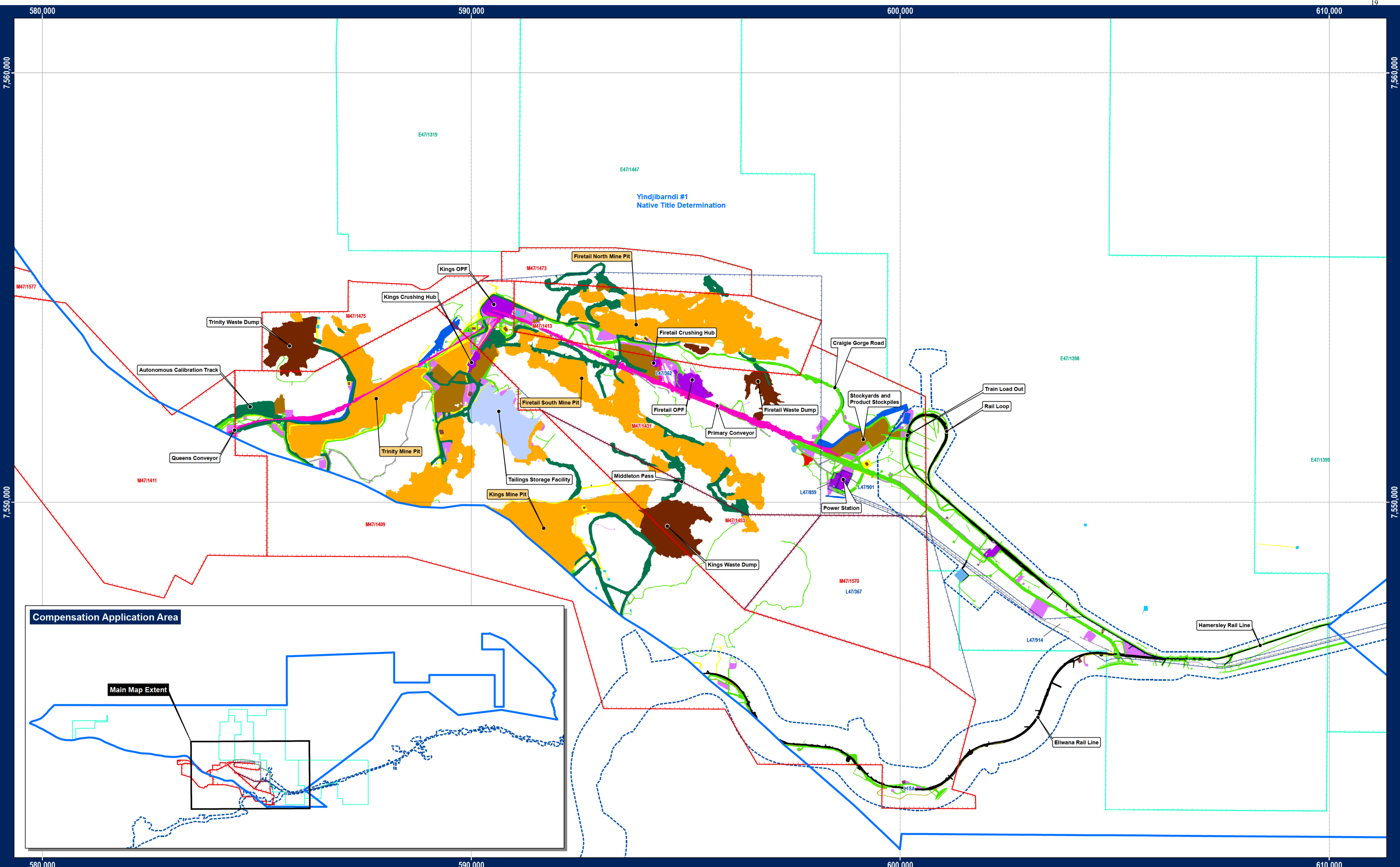
Respondents

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Signature of witness

a legal practitioner who has held a practice certificate for at least 2 years and who holds a current practice certificate.

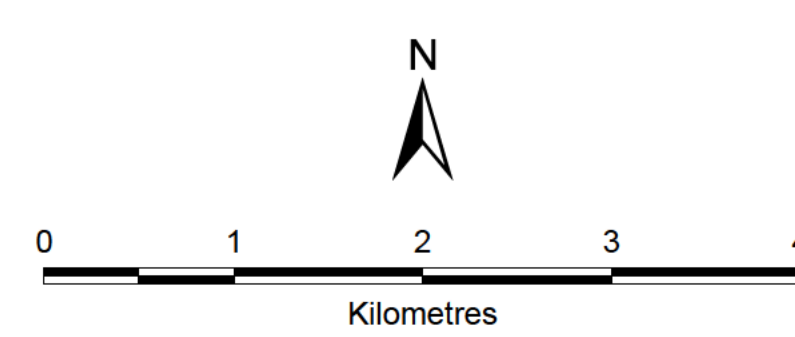


LEGEND

● FMG Infrastructure	■ Borefield	■ Landfill Site	■ Tailings and Residue Storage Facility	■ Water Pipeline
● Mining Pits	■ Building or Camp Site	■ Laydown or Hardstand Area	■ Waste Dump	■ Access Road
■ Yindjibarndi Determination Area	■ Dam - Fresh Water	■ Mine Pits	■ Workshop	■ Conveyor
■ FMG Mining Leases	■ Diversion Channel or Drain	■ Plant Site		■ Haul Road
■ FMG Misc. Licence	■ Fuel Storage Facility	■ ROM		■ Rail
■ FMG Misc. Licence S.A.				■ Powerline Infrastructure
■ FMG Exploration Licences				■ Optic Fibre Cable

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FMG Respondents' Infrastructure Map "B"



“SNC-6”

WAD 37 of 2022

Federal Court of Australia

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Division: General

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Signature of witness

a legal practitioner who has held a practice certificate for at least 2 years and who holds a current practice certificate.

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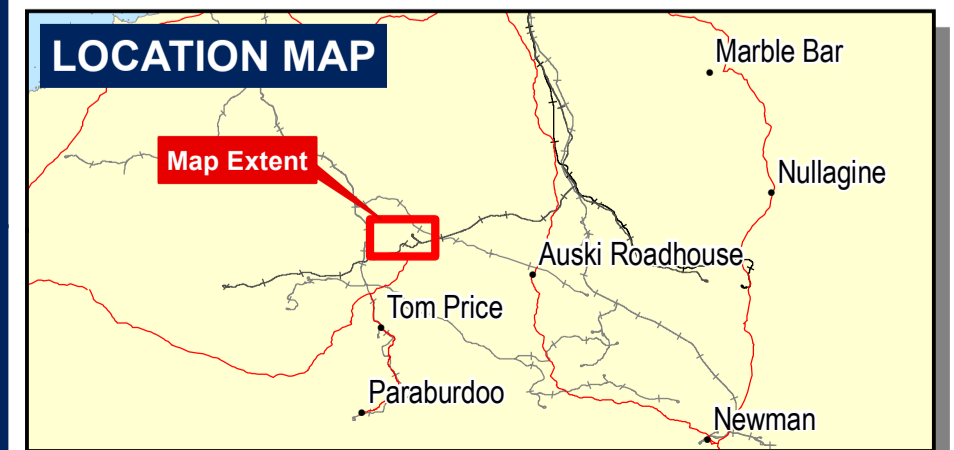
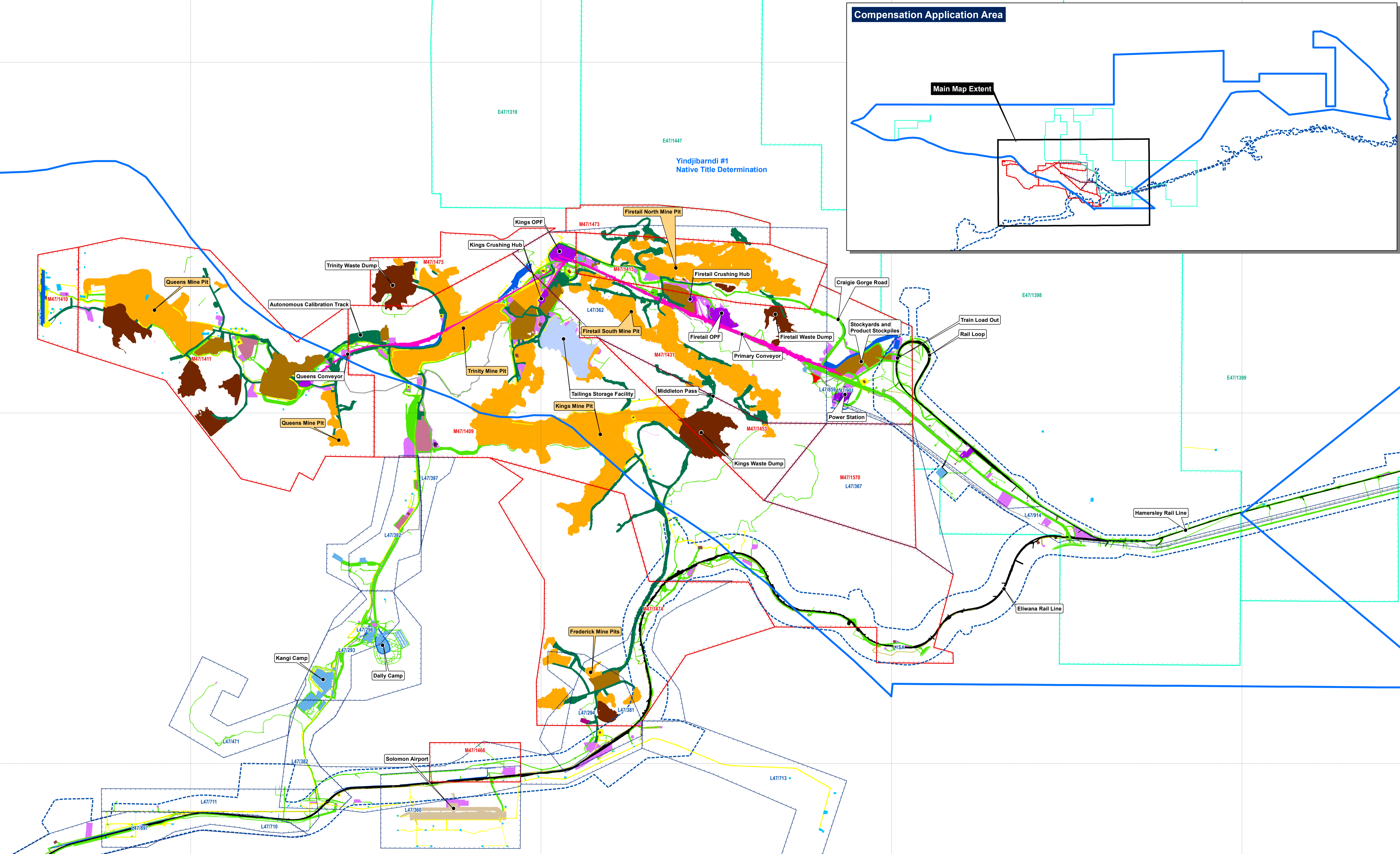
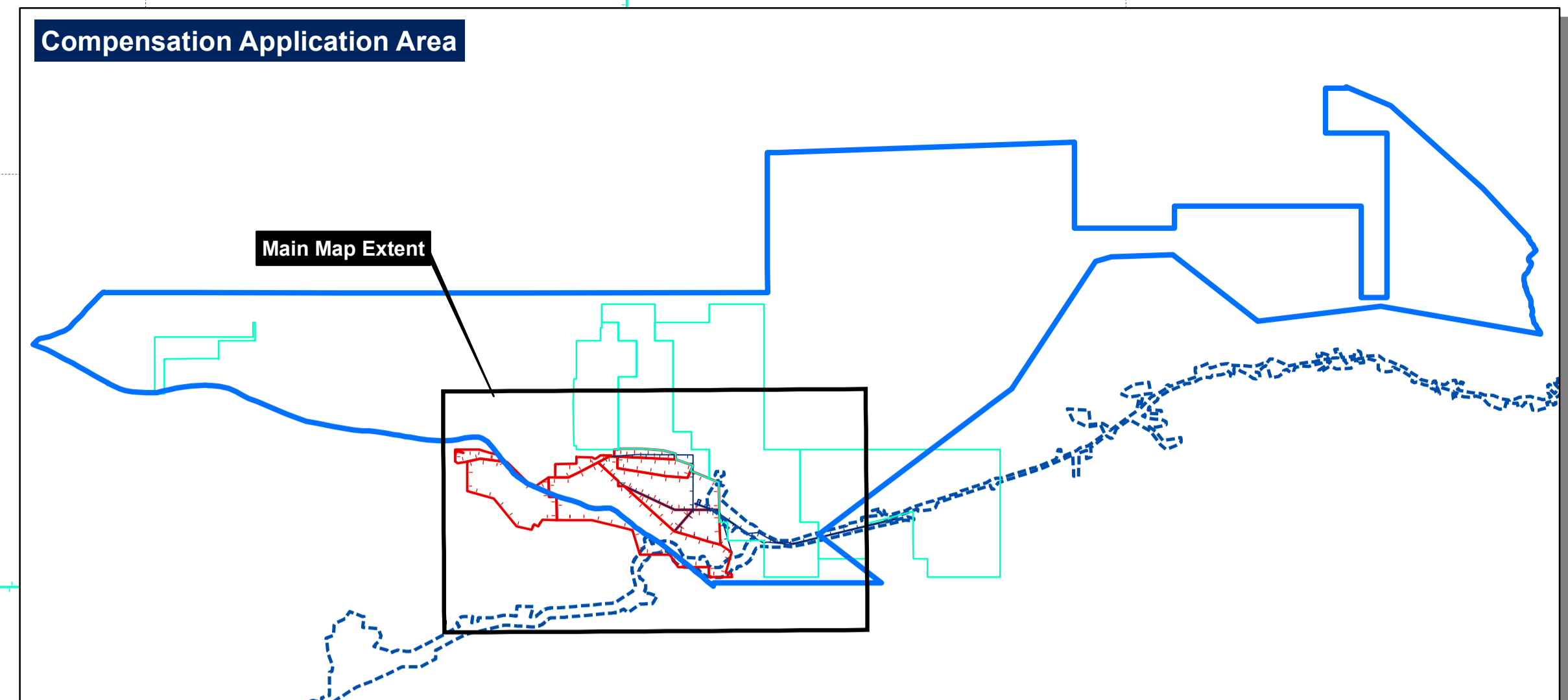
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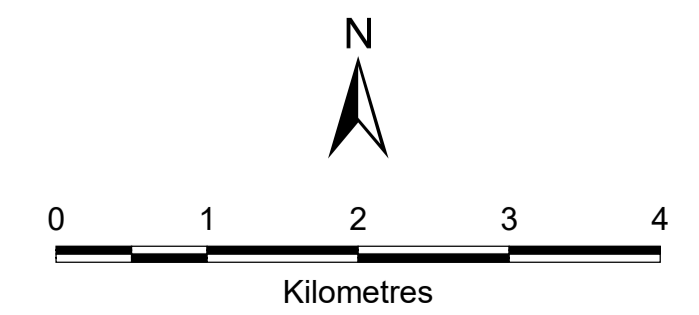
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LEGEND

● FMG Infrastructure	■ Airstrip	■ Diversion Channel or Drain	■ Plant Site	■ Water Pipeline
● Mining Pits	■ Borefield	■ Fuel Storage Facility	■ ROM	■ Access Road
■ Yindjibarndi Determination Area	■ Building or Camp Site	■ Landfill Site	■ Tailings and Residue Storage Facility	■ Conveyor
■ FMG Mining Leases	■ Core Yard	■ Laydown or Hardstand Area	■ Waste Dump	■ Haul Road
■ FMG Misc. Licence	■ Dam - Fresh Water	■ Mine Pits	■ Workshop	■ Rail
■ FMG Misc. Licence S.A.				■ Powerline Infrastructure
■ FMG Exploration Licences				■ Optic Fibre Cable



Scale: 1:50,000
 Coordinate System: GDA 1994 MGA Zone 50
 Document Name: 100_MP_OP_0159_030_r0

Date: 28/06/2023
 Size: A1L

**Reported disturbance in the Solomon Mine area
 Map "C"**

NOTICE OF FILING

Details of Filing

Document Lodged: Affidavit - Form 59 - Rule 29.02(1)
Court of Filing: FEDERAL COURT OF AUSTRALIA (FCA)
Date of Lodgment: 3/07/2023 9:59:52 AM AWST
Date Accepted for Filing: 3/07/2023 10:00:01 AM AWST
File Number: WAD37/2022
File Title: YINDJIBARNDI NGURRA ABORIGINAL CORPORATION RNTBC (ICN 8721) AND STATE OF WESTERN AUSTRALIA & ORS
Registry: WESTERN AUSTRALIA REGISTRY - FEDERAL COURT OF AUSTRALIA



Sia Lagos

Registrar

Important Information

This Notice has been inserted as the first page of the document which has been accepted for electronic filing. It is now taken to be part of that document for the purposes of the proceeding in the Court and contains important information for all parties to that proceeding. It must be included in the document served on each of those parties.

The date of the filing of the document is determined pursuant to the Court's Rules.