

**ASX RELEASE**ABN: 45 116 153 514

ASX: TMX

14 September 2017

# **Great Western - 12 Months Works Review & Update**

Throughout the last twelve months **Terrain Minerals Limited (ASX: TMX)** has been maintaining its focus on advancing the 100% owned Great Western Gold Project, towards a production ready status. The board views these systematic advancement initiatives as being a crucial part in adding real value to the project. Much of this work is carried out by consultants with changes of direction being made as new findings are presented.

In the previous year 2015/16, Terrain carried out extension drilling at Great Western and engaged CSA Global consultants to complete a Scoping study. Findings indicated the project was robust and additional drilling was warranted to increase and maximise value and advance the deposit towards production and required to meet the requirements to publish the outcomes due to regulatory changes. An RC drill program was executed with better than expected intersections and grades. These results were integrated into a new JORC 2102 resource, which lifted most of the material into Measured & Indicated categories. A new scoping study was also conducted by CSA Global which examined onsite processing scenarios.

The board is excited with the positive gains achieved at Great Western throughout the year and will continue to add and extract maximum value for shareholders, as well as concurrently looking at other project opportunities.

#### Headings of the Key works undertaken during the past year:

- 1. Key Findings from JORC 2012 and Scoping Study Findings (2015/16)
- 2. Design RC Drill Program Aimed at Lift Inferred Material Categories
- 3. Successful Execution of Drilling Campaign
- 4. JORC 2012 Resource Upgrade at Great Western
- 5. Successful Onsite Processing Study Completed
- 6. Updated Scoping Study Focusing on Site Processing
- 7. Regional Exploration Program at Great Western
- 8. Great Western Corporate & Development Initiatives

Refer to corresponding headings below for additional information:



# **Great Western Gold Project - Project Overview**

M37/54 - The 100% owned project is located 76km north of Leonora and 1km from the Goldfields Highway on Weebo pastoral leases and forms part of the historic Wilsons Patch mining area. Terrain considers it as an advanced and close to mine opportunity which has the potential to extend down plunge and along strike.

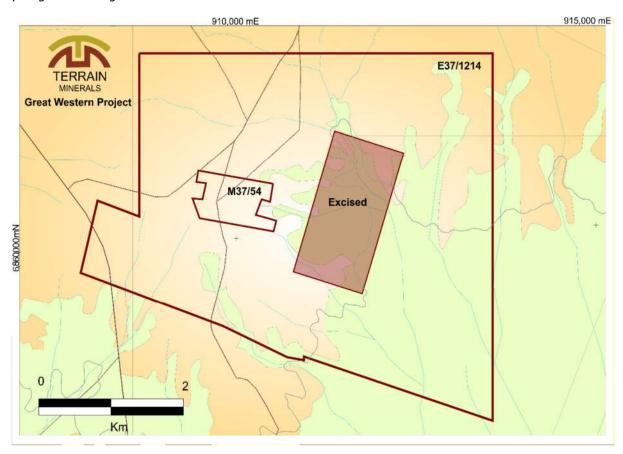
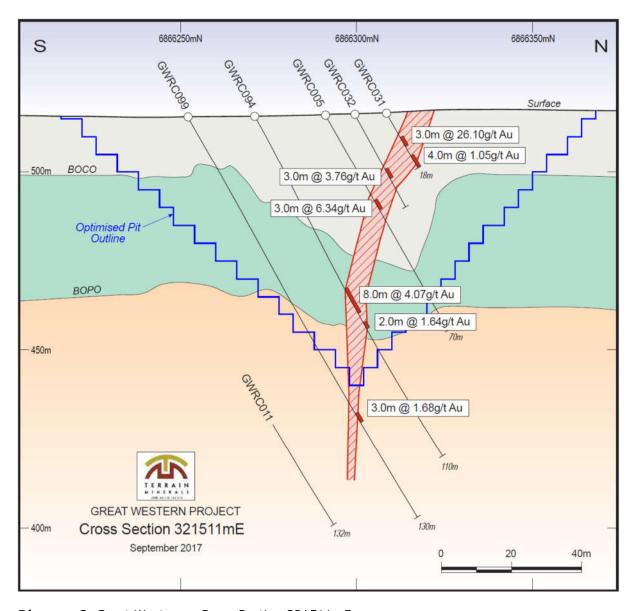


Diagram 1. Great Western Tenement Package





**Diagram 2.** Great Western – Cross Section 321511mE



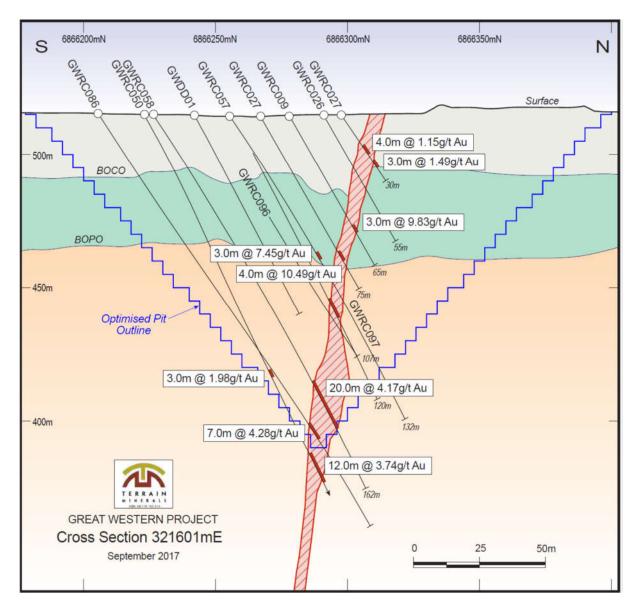


Diagram 3. Great Western - Cross Section 321601mE



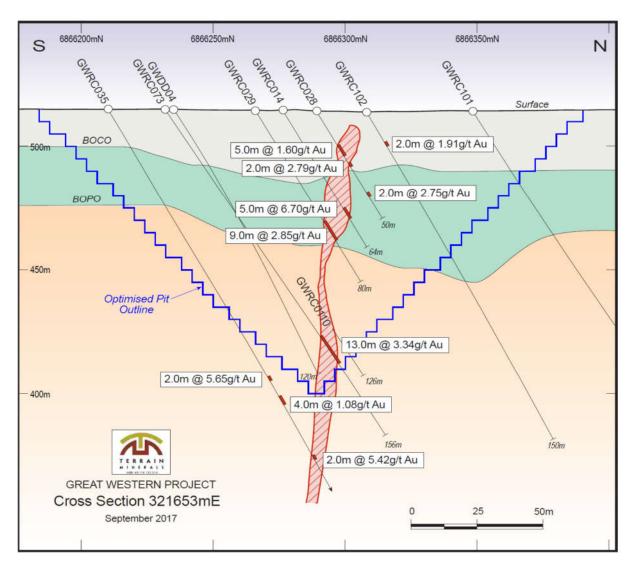


Diagram 4. Great Western - Cross Section 321653mE



# 1. Key Findings from JORC 2012 & Scoping Study Findings (2015/16)

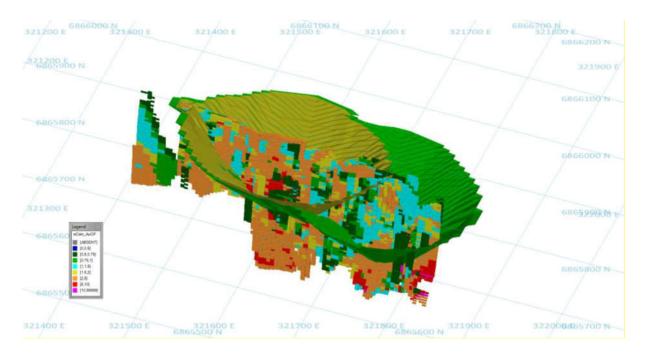
Key scoping study findings from 2015/16 works: Due to the new reporting regime on announcing results at scoping study level Terrain has been examining what additional information is required to lift the scoping study to a pre-feasibility level. Terrain once again engaged mining consultants CSA Global Limited to complete the scoping study.

Additional works identified for Great Western for a single open pit operation study:

- 42% of the JORC 2012 compliant model is classified as Inferred and the majority of this was located at the eastern end of the current block model. Refer to Diagram 5 for further explanation.
- An RC drilling program is warranted to infill the current gaps in the eastern portion of the
  inferred resource. The drilling program will be designed to, if successful, provide the
  required data to increase the confidence level of the Assuming positive drilling results the
  current JORC 2012 model will be updated so to reclassify the eastern portion of the deposit
  from Inferred to Indicated status and for inclusion in the pre-feasibility model.
- The previous scoping study using Toll milling has identified that an onsite process study is also warranted:
  - Work is underway to better defining mining, transport and toll treating costs.
  - A metallurgist has designing a ~250,000 ton per annum onsite crushing and gravity circuit. Sourcing available used components and budgets for installation and operational costs.
  - Previous Abdel metallurgical test work indicated a high gravity recovery was achieved.

Refer to ASX release: 31 May 2016 - Great Western Scoping Study Progress Update





**Diagram 5.** Two of the proposed pit shells from the Scoping study

The above smaller inner pit shell on the right-hand side predominately contains the Measured and Indicated classified material. The larger dark green outer pit shell on the right contains the eastern 42% inferred material. As this 42% Inferred represents a large percentage of metal, and now due to the new reporting standards internal confidence in this resource needs to be confirmed before being able to report the findings publicly. During the year the refed to 42% Inferred material was upgraded and subsequently the JORC 2012 and Scoping Studies have been updated.

# 2. Design RC Drill Program Aimed at Lift Inferred Material Categories

Terrain secured the services of Senior Geologist Trevor Bradley (on a casual basis). Bradley was tasked with reviewing data and designing a strategy of advancing Great Western gold project to the mine approval stage.

Planning for the stage 1 drill program has commenced and is seen as a priority task.

The Bradley report suggested a 2-stage drill program aimed a better defining known mineralisation within the pit shells, model by CSA Global as part of the ongoing scoping study and design.

Stage 1: RC Drilling 1,020m for 21 holes	Planning Approval is underway.
Stage 2: RC with Diamond Tails 1,031m for 9 holes	546m RC & 485m Diamond Total 1,031m



The aim of the programme was twofold:

- 7 holes for 654m targeted mineralisation on the eastern portion of the currently defined resource to increase confidence in continuity of the lodes and lift 42% of the resources from inferred to indicated status so they can be incorporated into the current scoping studies.
- 11 holes for 354m were completed to test previously inadequately defined shallow oxide zones in and around the historical workings.

**Refer to ASX release: 3 October 2016** Drilling Campaign - Great Western - Renewed Focus Aims to Drive Great Western to Mine Approval Stage

# 3. Successful Execution of Drilling Campaign

### **Exceptional Drill Results where achieved at Great Western Gold Project:**

**Terrain Minerals Limited (ASX: TMX)** is very pleased to announce these exceptional drilling results from the December 2016 Great Western - Stage 1 drilling campaign comprising of 18 RC holes for 1,308 metres. Refer to Diagram 1 and Table 1.

This program achieved all desired outcomes and returned wider intersections and higher grade than expected in many holes.

**Firstly;** Infill drilling at the eastern end aimed at lifting the majority of the 42% of the JORC 2012 resource in this location (see ASX release 24/08/2015) from Inferred to Indicated status. All holes intersected mineralisation. Some of the better intersections include:

- GWRC0120 6m @ 1.56g/t Au from 37m down hole
- GWRC0121 **5m** @ **6.98g/t** Au from **88m** down hole
- GWRC0123 2m @ 12.1g/t Au from 82m down hole
  - & 2m @ 24.4g/t Au from 99m down hole
- GWRC0124 2m @ 3.12g/t Au from 26m down hole

**Secondly;** The remaining holes targeted the previously poorly tested shallow mineralised zones in and around historical workings. Some of the better intersections include:

- GWRC0126 **7m** @ **4.43g/t** Au from **18m** down hole
- GWRC0129 **3m** @ **3.92g/t** Au from **27m** down hole
- GWRC0130 8m @ 3.20q/t Au from 25m down hole
- GWRC0131 **3m** @ **26.6g/t** Au from **8m** down hole
- GWRC0132 **3m** @ **3.76g/t** Au from **14m** down hole
- GWRC0135 **5m @ 1.97g/t** Au from **13m** down hole

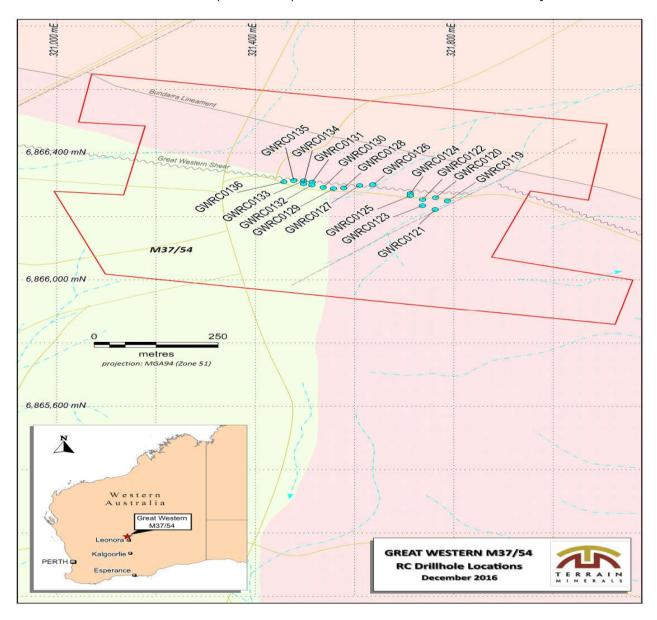
The above shallower intersections have the potential to improve the grade response in the mineral resource model (when updated) in this location and have a major effect to Great Western's required start-up capital and possibly bring forward positive cash flow in the current mining studies.



A total of 18 RC holes for 1,308m were drilled in December 2016 (for drill hole details Refer to ASX released on 11 January 2017).

**Other:** The drilling has also captured sufficient sample material across all ore types to be used for metallurgical analysis and ensuring robust QA/QC protocols and analysis occur. These samples are being stored at a secure location. All efforts are now focussing around advancing the Great Western Gold project towards production.

Refer to ASX release: 11 January 2017 - Exceptional Drill Results at Great Western Gold Project



**Diagram 6:** Great Western RC drill hole locations.



# 4. JORC 2012 Resource Upgrade at Great Western

Terrain updated the JORC resource to incorporate the recent Reverse Circulation (RC) drilling completed in December 2016. These results providing support to the continuity of the mineralised zones in the upper levels as well as the eastern end of the Deposit. Also, the nearer to surface drilling was used in conjunction with a review of previous logging to enable a defensible interpretation of the position of the underground stopes. As a result, the GW model is now even more robust than before. The mineral resource, adjusted to the recent mining scoping studies, is shown in the following Table.

# Reportable Mineral Resource

Reportable Milleral Resource								
Great Western Deposit								
Reportable in situ Mineral Resource depleted for mining								
Open Cut (0.5g/t) Underground (1.5g/t) Combined								
Class	Tonnes	Au g/t	Tonnes	Au g/t	Tonnes	Au g/t		
Measured	131,000	2.58			131,000	2.58		
Indicated	<u>332,000</u>	<u>3.15</u>	17,000	4.03	349,000	3.19		
Inferred	128,000	1.45	101,000	2.89	229,000	2.08		
TOTAL	<u>591,000</u>	<u>2.65</u>	118,000	3.05	709,000	2.72		

The tonnes have been rounded to the nearest 1000 - See resource details in Appendix 1

In comparison to the previous reported mineral resource (ASX Release 24 August 2015) at the same cut-offs there is a significant increase in the amount of material which has the potential to be included in an open cut mining scenario. There is also a significant increase in the Measured and Indicated component of the reportable resource.

In the above table under open cut there was an increase of 41,000 tons in the Measured category with the grade lifting from 2.35g/t to 2.58g/t and an increase of 166,000 tons in the Indicated category with grade lifting from 2.63 g/t to 3.15g/t.

In the first table, the mineral resource is reported above and below 120m from surface to reflect respectively areas within the model with potential for open cut and underground mining, additional economic studies are required to demonstrate economic viability. The reporting of the depth of open cut potential (20m more than previously reported) is the result of a preliminary mining scope study based on the previous 2015 mineral resource. This study on all material within the 2015 model used industry costs for transport, mining and processing and appropriate processing parameters related to similar styles of mineralisation. The mining depletion utilised the aforementioned stope model which equates to the previous production tonnage.



# Previous JORC 2012 Table from ASX Release 24 August 2015

Great Western Deposit Reportable in situ Mineral Resource depleted for mining								
Open Cut (0.5g/t) Underground (1.5g/t) Combined								
Class	Tonnes	Au g/t	Tonnes	Au g/t	Tonnes	Au g/t		
Measured	90,000	2.35			90,000	2.35		
Indicated	166,000	2.63	77,000	3.15	243,000	2.80		
Inferred	183,000	1.86	153,000	4.72	336,000	3.16		
TOTAL	439,000	2.25	230,000	4.20	669,000	2.92		

The tonnes have been rounded to the nearest 1000

Refer to ASX release: 27 March 2017 - JORC 2012 Resource Upgrade at Great Western

# 5. On Site Processing Study Completed

As part of the preliminary scoping studies recommendations, Terrain have been examining both toll treatment options and onsite processing options.

Terrain has appointed consulting metallurgist Mr Adrian Hall of Metallurgy Matters to design and cost onsite gravity milling solutions for Great Western. His concepts and designs have been based on the following early stage assumptions:

- Gravity recovery of ~85%
- ~400,000 ton of material\*
- Grade ~2.9g/t\*\*
- 25 to 40 ton per hour milling capacity

## **Gravity Recovery**\*\*\* has been based on these early stage results:

SAMPLE	Weight (g)	Au (ppm)	Gravity Au %
GW MET 01	309.5	77.6	90.36
GW MET 02	316.3	198	92.36
GW MET 03	313.6	25.1	80.83

Gravity Recovery Amdel 16/07/2009

**Quote:** from Amdel report 16/07/2009 "Surprisingly a significate amount of "free gold" was recovered at this stage".

The option of onsite processing is attractive and potentially has a number of advantages over batch treating at third party plants. One of the principal advantages is the potential to create a constant cash flow rather an erratic one that may result from third party treatment in batches.



The proposed onsite gravity processing design (No CIL circuit) has the potential to lower Opex costs.

Preliminary work suggests gravity tails are amenable to CIL processing and possibly other viable processing alternatives or on-selling of this material. No economic studies have been carried out on this material to date.

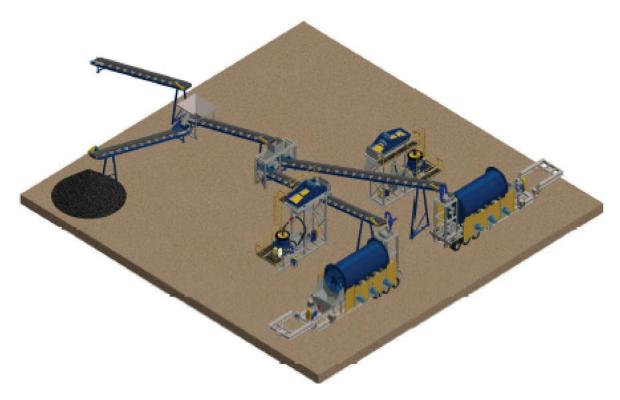
As this early stage, metallurgy work has indicated the gold is of a course nature, which suits the suggested onsite gravity treatment option. This also eliminates potential metal reconciliation issues often encountered when utilising third party plants.

## Hall has suggested the following conceptual on-site lay outs:



**Diagram 7:** Sepro Systems 75 tph three stage crushing circuit.





**Diagram 8:** Sepro Systems 40 tph grinding and gravity plant (dual stream mills and centrifugal concentrators).

This scoping level work and the results will be used in further studies, including detailed pit design work and preparation of an Ore Reserve.

#### Footnotes:

\*~ **400,000 ton Material** The material estimate has been taken from several in-house scoping level studies of various pit designs and the recent JORC 2012 compliant mineral resource. Refer to ASX Announcement released on 24/08/2015.

\*\*Grade ~2.9g/t: Grades are from an undiluted resource estimation, and various in-house pit designs at scoping study level and the JORC 2012 compliant resources; Refer to Announcement released on 24/08/2015 – "Great Western Gold Resource, Now JORC 2012 Compliant & Project Update".

\*\*\***Gravity Recovery:** Sample material is presentive of oxide and transitional material of limited volume. Additional bulk testing is required. This material will be collected from the drilling campaign announced on the 03/10/2016.

Refer to ASX release: 10 October 2016 - Great Western - Onsite Gold Processing Studies



## 6. Update Scoping Study - Focusing on Onsite Processing

## Great Western - Scoping Study Update & Onsite Gold Processing

At the request of Terrain Minerals (Terrain), CSA Global undertook the process of updating the 2017 scoping study for the Great Western deposit located 76km North of Leanora along Goldfield Highway. CSA Global used Whittle open pit optimisation software to test a range of mining scenarios, all returning positive undiscounted cash flows.

Based upon earlier studies by CSA Global, that focused the optimisations on the Measured and Indicated material with onsite gravity processing only (no CIL). The comparison scenarios, that included Inferred material, showed increases of only approximately 10% in undiscounted cash flows, highlighting the minimal impact the Inferred material has on the project economics.

The optimisation parameters from CSA Global 2017 Scenario 5 have remained unchanged, except for the updated processing cost. Due to the high-level nature of the study, and the volume of tonnes involved, all cash flows are shown undiscounted.

Due to the higher grade of the deposit the option to toll treat may still be a viable option for Terrain or others. As reported Terrain is currently discussing options to advance Great Western that include the outright or partial sale, various JV arrangements or self-mining. Discussion's continue with multiple groups who have registered interest and now have the completed CSA report.

**Cautionary Statement:** The Scoping Study referred to in this announcement has been undertaken to assess the economic viability of an open pit and processing facility at Great Western gold project. It is a preliminary technical and economic study of the potential viability of the Great Western project. It is based on low level technical and economic assessments that are not sufficient to support the estimation of ore reserves. Further evaluation work and appropriate studies are required before Terrain Minerals Limited will be in a position to estimate any ore reserves or to provide any assurance of an economic development case.

The study is based on material assumptions that are outlined. Terrain considers the material assumptions are based on reasonable grounds, but there is no certainty they will be correct or that the range of outcomes indicated in this study will be realised. The study includes the existing JORC 2012 code measured, indicated and inferred resources are defined with in the project. Investors are cautioned that there is low level geological confidence in inferred resources and additional drilling may not upgrade this material.

Additional funding will be required to fund mining and processing equipment. This could have a dilutionary effect to Terrains shares and there is no guarantee that funds can be raised. It is also possible that funding could come via selling part of the project or by entering into a Joint venture arrangement. In this case the projects ownership percentage would change. Terrain could also extract vale by an outright asset sale so never mining the deposit itself.

Given the uncertainty involved investors should not make any investment decisions based solely on the results of these studies.



# **Optimisation Parameters**

Optimisation parameters were selected by CSA Global using a combination of current/typical industry costs and recent gold pricing. Terrain provided CSA Global with technical reports and wage and power costs of \$20/t for a 250,000 tpa gravity gold circuit, including crushing. CSA Global added 20% to this figure to account for maintenance, consumables, spares and reagent costs, to arrive at a figure of \$24/t as seen in table 1 below.

A variety of scenarios, were used in the optimisation to test the viability of the Great Western deposit. Terrain indicated to CSA that onsite treating is the preferred processing option for this deposit. The parameters that change from scenario to scenario are gold price, and resource classifications used in the optimisation.

The 2017 Resource model supplied to CSA Global contains 15% Inferred material, the scenarios were also optimised on Measured and Indicated material to provide the best basis for further work leading towards a JORC 2012 Ore Reserve statement.

SCENARIO	GOLD	MINING		MILL PR	OCESSING	OPTIMISATION	
	PRICE	DILUTION	RECOVERY	COST	HAULAGE	RECOVERY	CLASSIFICATION
							S
1	\$1,600/	10%	95%	\$24/t	\$0/t	85%	MEA + IND
	OZ						
2	\$1,600/	10%	95%	\$24/t	\$0/t	85%	ALL
	OZ						
3	\$1,500/	10%	95%	\$24/t	\$0/t	85%	MEA + IND
	OZ						
4	\$1,500/	10%	95%	\$24/t	\$0/t	85%	ALL
	OZ						
5	\$1,700/	10%	95%	\$24/t	\$0/t	85%	MEA + IND
	OZ						
6	\$1,700/	10%	95%	\$24/t	\$0/t	85%	ALL
	OZ						

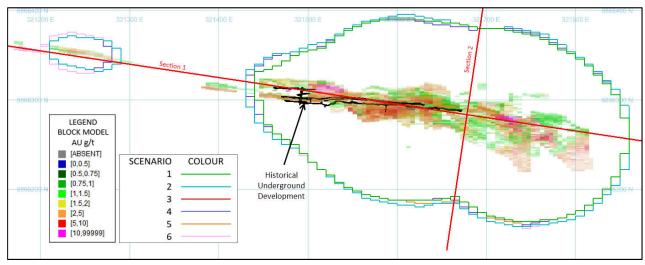
Table 1: Optimisation Scenarios



SCENARIO	ORE PROCESSED				OUNCES	WASTE	STRIP	UNDISCOUNTED	
	TONNES	AU	MEA IND INF		RECOVERED	TONNES	RATIO	CASH FLOW	
		g/t							
1	381,200	3.0	33.8%	66.2%	0.0%	31,400	6,557,500	17.2	All Positive
2	465,300	2.8	28.1%	57.6%	14.3%	35,600	7,237,400	15.6	"
3	372,800	3.1	34.4%	65.6%	0.0%	31,200	6,501,200	17.4	"
4	436,000	2.9	29.5%	57.6%	12.9%	34,100	6,732,600	15.4	"
5	404,600	2.9	32.1%	67.9%	0.0%	32,200	6,756,700	16.7	"
6	488,300	2.7	26.9%	58.7%	14.4%	36,000	7,254,100	14.9	"

**Table 2:** Scenario output results for select pit shell. (due to early nature of report the positive cash flow numbers are not quoted due to reporting rules)

Figure 1 through to 3 show representative sections of the selected pit shells. All figures have the historical underground development wireframe displayed in black. The Figure 1 plan view shows the section lines, surface intersection of the shells, and the block model displaying gold grade above 1.0 g/t. Figure 2 and Figure 3, are vertical sections of the pit shells with the block model displaying gold grade above 1.0 g/t. Figure 4, shows the same sections with the block model displaying the Resource class to highlight the proportion of each material class in the scenarios.



**Figure 1:** Plan view showing AU>1.0 g/t, pit shell intersections at 515 mRL and pit shell section lines



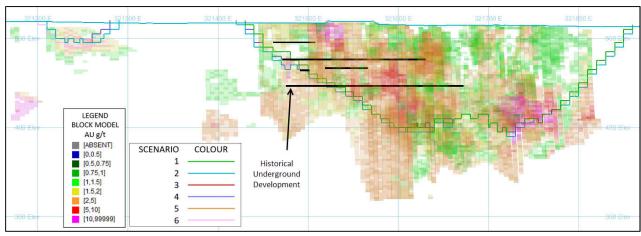


Figure 2: Section 1 – Pit shell intersections for all scenarios with block model grade AU>1.0 g/t

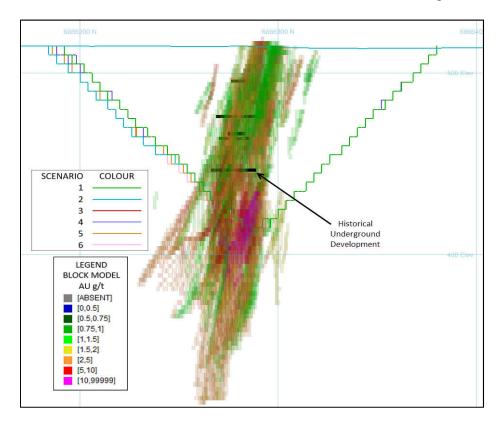
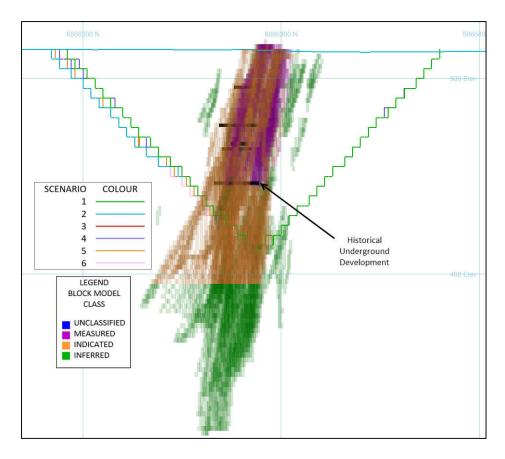


Figure 3: Section 2 – Pit shell intersections for all scenarios with block model gradeAU>1.0 g/t





**Figure 4:** Section 2 – Pit shell intersections for all scenarios with block model Resource class & AU>1.0 g/t

Figure 4 highlights the resources categories and highlights further drilling is required to upgrade deeper mineralisation and is required to test the open depth extensions.

## Conclusion

All pit shell optimisation scenarios analysed return positive undiscounted cash flow, indicating that the Great Western deposit is likely to be a viable deposit for a small scale open cut mining operation.

The conclusions of this report are made based on the latest Mineral Resource model (DataGeo, 2017) which accounts for estimated depletion from historical underground workings.

Installing a small gravity recovery facility onsite, to mine and treat ore onsite is indicated to be a viable scenario. With limited capital costs which are under review, which cover processing plant, site establishment, contractor mobilisation, and permitting, it is likely that this option will return a reasonable return on invested capital.

Refer to ASX release: 02 August 2017 - Great Western - Scoping Study Update & Onsite Gold Processing &

27 March 2017 - JORC 2012 Resource Upgrade at Great Western



## 7. Regional Exploration at Great Western

During the Year, a two-week field program was executed at Great Western and Great Western East aimed at exploring for adding additional inventory to the existing resource to extend the mine life or a future on site gold operation.

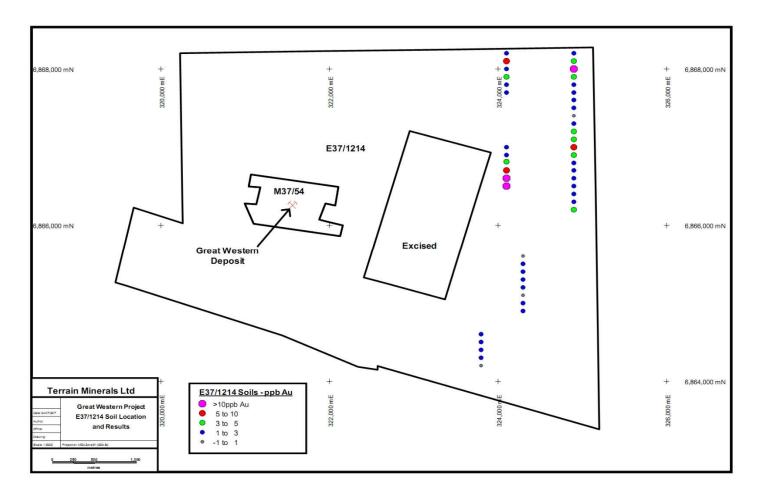
#### **Great Western:**

An orientation surface geochemical soil programme was undertaken on E37/1214 that wholly surrounds the Great Western Deposit. A total of 46 samples were collected on a nominal 800x100m spacing. The aim of the programme was to complete a first pass test of structural trends identified from geophysics for potential mineralisation in the eastern portion of the tenement. Results confirmed multiple trends of low level (>10ppb gold) anomalism. The results are considered encouraging and a more detailed follow up soil programme will be designed to further delineate the trends. See Figure 1 below for additional details.

#### **Great Western - East:**

During the Quarter Terrain also applied for 3 tenements adjacent to Great Western Project area, E37/1312, E37/1307 and E37/1308. The combined area contained 170~ blocks (84,000~ Acre's). Desk top studies identified several old historical reports which highlighted multiple high-grade anomalies. On completing the review and a reconnaissance program was designed to locate, validate and assess these areas prior to releasing of history results. The field trip aim was to assess the potential of identifying additional shallow tones to the Great Western Project. After reviewing the results against the filed observations all land areas where relinquished prior to grant.





**Diagram 9:** Orientation Surface Geochemical Soil Programme at Great Western

Refer to ASX release: 27 July 2017 - Quarterly Activities Report: June 2017



## 8. Great Western Corporate & Development Initiatives

Terrain has been identifying and speaking with multiple groups who have indicated interest in participating in the development of the Great Western gold project. These groups have signed confidentiality agreements and continue to express interest in the project, in structures which include full or partial sale, joint venture and funding style arrangements. No agreement has been reached with any party.

The board has also been exploring self-mining options including the securing of gold funding opportunities via forward sales and partnerships with earth moving contractors who have indicated flexible payment arrangements such as funding development cost until positive cash flow.

Past studies have focused on both adding and realising value at Great Western. The board is of the opinion that risk and reward must now be carefully considered when comparing all possibilities including trade sale or moving forward and into production.

Justin Virgin

**Executive Director** 

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## **ABOUT TERRAIN MINERALS LIMITED:**

Terrain Minerals Limited (ASX:TMX) is a minerals exploration company with a Western Australian based asset portfolio consisting of:

- **Great Western** 100% TMX (Au)- near term development opportunity, resource estimation and economic study have shown positive outcomes. Work is now underway to prepare data and work towards getting all mining approvals;
- **Great Western advancement process** is underway with multiple groups who have registered interest in Great Western. These groups have indicated various agendas that included full or partial sale, joint venture and funding arrangements. The board will consider all proposals and has not ruled out mining Great Western itself and continuing regional exploration to add to its gold inventory.
- Project Review: Terrain Minerals is currently searching and has been assessing potential projects:
   Gold, Cobalt/copper Lithium and industrial minerals in Australia, Africa, South America and Asia also
   including other regions. Several jurisdictions of interest have now been identified. All economic
   commodities are being considered as indicated in previous Quarterly reports.