



Caesium Market Research Report

Date: January, 2024

Author: Brendan Jephcott

Prepared by:

GOLDEN DRAGON CAPITAL

GOLDEN DRAGON CAPITAL

Table of Contents

Executive Summary	2
1.0 Introduction	9
2.0 Occurrence and Production	10
3.0 Commercialisation	13
3.1 Industry Chain	13
3.2 Mining and Processing	13
3.2.1 Mining and Beneficiation	13
3.2.2 Processing – Pollucite.....	14
3.2.3 Processing – Salt Lake Brine.....	17
3.3 Caesium Formate	17
4.0 Critical Mineral Status	21
5.0 Sinomine Resource Group Co., Ltd	22
5.1 Caesium Mining and Chemical Salt Business	23
5.1.1 Mining and Beneficiation	23
5.1.2 Caesium Salts and Caesium Formate Business	25
5.2 Financial Situation	28
References.....	30
Disclaimer	31

GOLDEN DRAGON CAPITAL LIMITED

Address: 9QRC, 9 Queen's Road Central, Central, Hong Kong, China
Telephone: +852 4647 0122
All correspondence to email: brendan@goldendragoncapital.com
Website: www.goldendragoncapital.com

GOLDEN DRAGON CAPITAL

List of Figures

Figure 1: Pollucite mineral ore containing caesium oxide (left), and caesium formate brine (right).....	10
Figure 2: Global distribution of contained caesium mineral resources (excl China)	12
Figure 3: Principal processing flowsheet of the main caesium chemical salt products.....	14
Figure 4: Caesium industry chain and downstream products.....	15
Figure 5: Market prices of caesium salts and metal in China 2015 to 2020 (1USD~7CNY))	16
Figure 6: Santos Basin, Brazil showing wells and production fields	18
Figure 7: Gulf of Mexico, active leases by water depth	19
Figure 8: South China Sea, showing LS17-2 (yellow)	19
Figure 9: UK North Sea Elgin and Franklin Fields (illustrative)	21
Figure 10: Sinomine stock price history (source: Bloomberg)	22
Figure 11: Cabot SF (now Sinomine Specialty Fluids Ltd)	23
Figure 12: Bikita Mine, Zimbabwe	24
Figure 13: Sinclair Mine, Australia.....	24
Figure 14: Tanco Mine, Manitoba, Canada	25
Figure 15: Sinomine caesium chemical salt industry chain layout.....	26
Figure 16: Sinomine caesium chemical salt vertically-integrated business model	26
Figure 17: Caesium formate ecological operation system of Sinomine	27
Figure 18: Caesium formate drilling fluid and completion fluid recovery process	27
Figure 19: Main downstream customers of the company's caesium formate business	27
Figure 20: Sinomine sales volume of caesium and rubidium fine chemicals.....	29
Figure 21: Sinomine caesium/rubidium salt and caesium formate financials 2023-H1.....	29

List of Tables

Table 1: Properties of Caesium.....	9
Table 2: Main caesium deposit types, geological characteristics and typical deposits	11
Table 3: Caesium mineral, oxide content and availability	11
Table 4: Global distribution of contained caesium mineral resources (excl China)	12
Table 5: Distribution and caesium mineral reserves in China	13
Table 6: Physical and chemical properties of caesium salts	15
Table 7: Caesium metal and chemical salt applications	16
Table 8: Properties of caesium formate solution	17
Table 9: Major new discoveries of large deep-water oilfields in the world since 2000.....	18
Table 10: Application areas of caesium products	22
Table 11: Tanco Mine caesium mineral resources	25
Table 12: Sinomine: rubidium and caesium salt production capacity and output (tonnes)	26
Table 13: Sinomine caesium chemical salt & caesium formate sales and forecast (2020-2025E).....	28