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UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

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**FORM S-8**  
REGISTRATION STATEMENT  
UNDER  
THE SECURITIES ACT OF 1933

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**ASP ISOTOPES INC.**

(Exact name of registrant as specified in its charter)

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**Delaware**

(State or other jurisdiction of  
incorporation or organization)

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**87-2618235**

(I.R.S. Employer  
Identification No.)

**1101 Pennsylvania Avenue NW, Suite 300**  
**Washington, D.C. 20004**  
(Address of Principal Executive Offices) (Zip Code)

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**ASP ISOTOPES INC. 2022 EQUITY INCENTIVE PLAN**  
(Full title of the plan)

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**Paul E. Mann**  
**Executive Chairman and Chief Executive Officer**  
**ASP Isotopes Inc.**  
**1101 Pennsylvania Avenue NW, Suite 300**  
**Washington, D.C. 20004**  
(Name and address of agent for service)

**(202) 756-2245**  
(Telephone number, including area code, of agent for service)

*Copy to:*  
**Donald G. Ainscow, Esq.**  
**Blank Rome LLP**  
**200 Crescent Court, Suite 1000**  
**Dallas, TX 75201**  
**Tel: (972) 850-1450**  
**Fax: (972) 850-1451**

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer   
Non-accelerated filer

Accelerated filer   
Smaller reporting company   
Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act

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### Explanatory Note

Pursuant to General Instruction E to Form S-8 under the Securities Act of 1933, as amended (the “Securities Act”), ASP Isotopes Inc. (the “Company”) is filing this Registration Statement on Form S-8 (the “Registration Statement”) for the purpose of registering additional shares of the Company’s common stock, par value \$0.01 per share (“Common Stock”), issuable under the ASP Isotopes Inc. 2022 Equity Incentive Plan (the “2022 Plan”). The number of shares of Common Stock available for issuance under the 2022 Plan is 5,000,000 shares of Common Stock, subject to an annual increase on January 1 of each year beginning in 2023 for a period of ten (10) years, in an amount equal to the lesser of (i) five percent (5%) of the total number of shares of Common Stock outstanding on December 31 of the preceding calendar year, or (ii) such number of shares of Common Stock determined by the Board of Directors of the Company (the “Evergreen Provision”). This Registration Statement registers an aggregate of 2,446,164 additional shares of Common Stock available for issuance under the 2022 Plan as a result of the Evergreen Provision, which shares were automatically made so available on the first day of 2024, representing 5% of the total number of shares of Common Stock outstanding on December 31, 2023.

The shares of Common Stock registered pursuant to this Registration Statement are of the same class of securities as the 8,200,000 shares of Common Stock registered for issuance under the 2022 Plan pursuant to the currently effective Registration Statement on Form S-8 (File No. 333-268421) filed on November 16, 2022 (representing 5,000,000 shares of Common Stock initially available for future grants under the 2022 Plan, and an additional 3,200,000 shares of Common Stock anticipated to become available for issuance under the 2022 Plan pursuant to the Evergreen Provision). The information contained in the Company’s Registration Statement on Form S-8 (File No. 333-268421) is hereby incorporated by reference pursuant to General Instruction E. Any items in the Company’s Registration Statement on Form S-8 (File No. 333-268421) not expressly changed hereby shall be as set forth in the Company’s Registration Statement on Form S-8 (File No. 333-268421).

## PART II

### INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

#### Item 3. Incorporation of Documents by Reference.

The following documents previously filed by the Registrant with the Securities and Exchange Commission (the "Commission") pursuant to the Securities Act and the Securities Exchange Act of 1934, as amended (the "Exchange Act"), are incorporated herein by reference:

- (a) the Registrant's Annual Report on [Form 10-K for the year ended December 31, 2023](#) filed with the SEC on April 10, 2024, and as amended by that [Form 10-K/A](#) filed with the SEC on April 29, 2024;
- (b) the Registrant's Quarterly Report on Form 10-Q for the quarter ended [March 31, 2024](#), filed with the SEC on May 15, 2024;
- (c) the Registrant's Current Reports on Form 8-K filed on [January 18, 2024](#), [February 29, 2024](#), [April 9, 2024](#), and [June 6, 2024](#) and;
- (d) the description of the Registrant's common stock contained in Exhibit 4.1 to the Registrant's Annual Report on Form 10-K filed with the SEC on [April 10, 2024](#), including any amendments or reports filed for the purpose of updating such description.

All documents subsequently filed by the Registrant with the Commission pursuant to Sections 13(a), 13(c), 14, or 15(d) of the Exchange Act, prior to the filing of a post-effective amendment to the Registration Statement which indicates that all securities offered have been sold or which deregisters all securities then remaining unsold, shall be deemed incorporated by reference into this Registration Statement and to be a part hereof from the date of the filing of such documents.

The Registrant is not incorporating by reference any information or document, or portion thereof, whether specifically listed above or to be filed in the future, that is furnished to, and is not deemed "filed" with, the Commission.

Any statement contained in a document incorporated or deemed to be incorporated by reference in this Registration Statement shall be deemed to be modified or superseded for purposes of this Registration Statement to the extent that a statement contained in this Registration Statement, or in any other subsequently filed document which also is or is deemed to be incorporated by reference in this Registration Statement, modifies or supersedes such earlier statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement.

Item 8. Exhibits.

(a) Exhibits

Exhibit Number	Exhibit Title	Filed Herewith	Incorporated by Reference			
			Form	Filing Date.	Exhibit	File No.
<a href="#">5.1</a>	<a href="#">Opinion of Blank Rome LLP</a>	X				
<a href="#">23.1</a>	<a href="#">Consent of Independent Registered Public Accounting Firm</a>	X				
23.2	Consent of Blank Rome LLP (included in Exhibit 5.1)	X				
<a href="#">24.1</a>	<a href="#">Power of Attorney (included on the signature page)</a>	X				
<a href="#">99.1</a>	<a href="#">ASP Isotopes Inc. 2022 Equity Incentive Plan and forms of award agreement thereunder</a>		S-1/A	10/11/2022	10.2	333-267392
<a href="#">107</a>	<a href="#">Filing Fee Table</a>	X				

## SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Washington, D.C. on June 12, 2024.

### ASP ISOTOPES INC.

By /s/ Paul E. Mann  
Paul E. Mann  
Executive Chairman and Chief Executive Officer

### POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that that each person whose signature appears below constitutes and appoints Paul E. Mann and Robert Ainscow, and each of them, as such person's true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for such person and in such person's name, place and stead, in any and all capacities, to sign any and all amendments, including post-effective amendments, to this Registration Statement, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done, as fully for all intents and purposes as such person might or could do in person, hereby approving, ratifying and confirming all that each of said attorneys-in-fact and agents or their substitute or substitutes may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed below by the following persons in the capacities and on the dates indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Paul E. Mann</u> Paul E. Mann	Executive Chairman, Chief Executive Officer and Director (Principal Executive Officer)	June 12, 2024
<u>/s/ Robert Ainscow</u> Robert Ainscow	Chief Operating Officer and Chief Financial Officer (Principal Financial and Accounting Officer)	June 12, 2024
<u>/s/ Michael Gorley, Ph.D.</u> Michael Gorley, Ph.D.	Director	June 12, 2024
<u>/s/ Duncan Moore, Ph.D.</u> Duncan Moore, Ph.D.	Director	June 12, 2024
<u>/s/ Robert Ryan</u> Robert Ryan	Director	June 12, 2024
<u>/s/ Hendrik Strydom, Ph.D.</u> Hendrik Strydom, Ph.D.	Director	June 12, 2024
<u>/s/ Todd Wider, M.D.</u> Todd Wider, M.D.	Director	June 12, 2024

# BLANKROME

One Logan Square  
130 North 18th Street | Philadelphia, PA 19103-6998  
blankrome.com

June 12, 2024

The Board of Directors  
ASP Isotopes Inc.  
1101 Pennsylvania Avenue NW, Suite 300  
Washington, D.C. 20004

**Re: ASP Isotopes Inc.  
Registration Statement on Form S-8**

Ladies and Gentlemen:

We have acted as counsel to ASP Isotopes Inc., a Delaware corporation (the "Company"), in connection with the preparation of a Registration Statement on Form S-8 (the "Registration Statement") to be filed by the Company with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), relating to the offer and sale of up to 2,446,164 shares (the "Shares") of common stock of the Company, par value \$0.01 per share ("Common Stock"), issuable under the Company's 2022 Equity Incentive Plan (the "Plan"). This opinion is furnished pursuant to the requirements of Item 601(b)(5) of Regulation S-K.

Although as counsel to the Company we have advised the Company in connection with a variety of matters referred to us by it, our services are limited to specific matters so referred. Consequently, we do not have knowledge of many transactions in which the Company has engaged or its day-to-day operations.

In rendering this opinion, we have examined the following documents: (i) the Amended and Restated Certificate of Incorporation of the Company; (ii) the Amended and Restated Bylaws of the Company; (iii) resolutions adopted by the Board of Directors and stockholders of the Company; (iv) a certificate from an officer of the Company; (v) the Registration Statement (including all exhibits thereto); (vi) the Plan; and (vii) such other documents as we deem relevant and necessary as a basis for the opinion hereinafter expressed. We have not performed any independent investigation in rendering this opinion other than the document examination described. We have assumed and relied, as to questions of fact and mixed questions of law and fact, on the truth, completeness, authenticity and due authorization of all certificates, documents, and records examined and the genuineness of all signatures.

In rendering this opinion, we have assumed that, the Shares will be issued in accordance with the terms and conditions of the Plan, and that at the time of issuance of any Shares, there shall be a sufficient number of duly authorized and unissued shares of the Company's Common Stock to accommodate the issuance of the Shares.

Our opinion is limited to the General Corporation Law of the State of Delaware, as amended.

Based upon and subject to the foregoing and the qualifications and limitations set forth below, we are of the opinion that the Shares, when issued in accordance with the terms of the Plan, will be validly issued, fully paid and nonassessable.

This opinion is given as of the date hereof. We assume no obligation to update or supplement this opinion to reflect any facts or circumstances which may hereafter come to our attention or any changes in laws which may hereafter occur.

This opinion is strictly limited to the matters stated herein and no other or more extensive opinion is intended, implied or to be inferred beyond the matters expressly stated herein.

We consent to the filing of this opinion as an exhibit to the Registration Statement. In giving such consent, we do not thereby admit that we are included in the category of persons whose consent is required by the Securities Act or the rules and regulations promulgated by the Commission.

Very truly yours,

/s/ Blank Rome LLP

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Blank Rome LLP

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We consent to the incorporation by reference in this Registration Statement of ASP Isotopes Inc. on Form S-8 to be filed on or about June 12, 2024 of our report dated April 10, 2024, on our audits of the financial statements as of December 31, 2023 and 2022 and for each of the years then ended, which report was included in the Annual Report on Form 10-K filed April 10, 2024. Our report includes an explanatory paragraph about the existence of substantial doubt concerning the Company's ability to continue as a going concern.

*/s/ EisnerAmper LLP*

EISNERAMPER LLP  
Iselin, New Jersey  
June 12, 2024



## Calculation of Filing Fee Tables

**FORM S-8**  
REGISTRATION STATEMENT UNDER  
THE SECURITIES ACT OF 1933

**ASP ISOTOPES INC.**  
(Exact Name of Registrant as Specified in its Charter)

Table 1: Newly Registered Securities

Security Type	Security Class Title	Fee Calculation Rule	Amount Registered <sup>(1)</sup>	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price	Fee Rate	Amount of Registration Fee
Equity	Common stock, \$0.01 par value per share	457(c) and 457(h) <sup>(2)</sup>	2,446,164 <sup>(3)</sup>	\$4.38 <sup>(2)</sup>	\$10,714,198.32	\$0.00014760	\$1,581.42
<b>Total Offering Amounts</b>					\$10,714,198.32		\$1,581.42
<b>Total Fee Offsets<sup>(4)</sup></b>							-
<b>Net Fee Due</b>							\$1,581.42

- (1) Pursuant to Rule 416(a) of the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement shall also cover any additional shares of Common Stock, \$0.01 par value per share ("Common Stock"), of ASP Isotopes Inc. (the "Registrant") that become issuable under the ASP Isotopes Inc. 2022 Equity Incentive Plan (the "2022 Plan") by reason of any stock dividend, stock split, recapitalization or other similar transaction effected without the receipt of consideration which results in an increase in the number of the outstanding shares of Common Stock.
- (2) Estimated in accordance with Rules 457(c) and 457(h) under the Securities Act solely for the purpose of calculating the registration fee on the basis of \$4.38 per share, which is the average of the high and low prices of the Registrant's Common Stock on June 6, 2024, as reported on the Nasdaq Capital Market.
- (3) Represents an automatic annual increase on January 1, 2024 to the number of shares of Common Stock reserved for issuance under the 2022 Plan, with the formula for such annual increase provided in the 2022 Plan.
- (4) The Registrant does not have any fee offsets.