



Capital  
Markets

EQUITY LINKED SECURITIES | RBC GLOBAL INVESTMENT SOLUTIONS

# RBC Energy Basket Callable Yield 10.50% Securities (CAD), Series 645 Non-Principal Protected Security

7 year term

Performance linked to the  
common shares of six  
Canadian energy companies

Potential 10.5000%  
coupon per annual period

Secondary Market

OTC

Autocall  
Observation Dates

November 27, 2023 and  
quarterly thereafter

This summary is qualified in its entirety by a pricing supplement (the “Pricing Supplement”), the base shelf prospectus dated March 25, 2022, the program prospectus supplement dated March 28, 2022, as supplemented November 11, 2022 and the product prospectus supplement dated March 28, 2022 in respect of equity, unit and debt linked securities, as supplemented November 11, 2022.

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## KEY TERMS

Issuer:	Royal Bank of Canada
Issuer Credit Ratings:	Moody's: Aa1; S&P: AA-; DBRS: AA
Currency:	CAD
Minimum Investment:	50 Securities or \$5,000
Term:	Approximately 7 years
Principal at Risk:	The Securities are not principal protected
Underlying Securities:	The return on the Securities is linked to the price performance (excluding any dividends and other distributions) of a notional portfolio (the “Portfolio”) of the common shares (the “Underlying Securities” and each, an “Underlying Security”) of the six Canadian energy companies listed below (the “Underlying Security Issuers” and each, an “Underlying Security Issuer”). The Underlying Securities will be equally weighted in the Portfolio (the “Portfolio Weight”) at the Initial Valuation Date. Such weightings will not be adjusted or rebalanced during the term of the Securities. Securities do not represent an interest in the Underlying Securities, and holders will have no right or entitlement to the Underlying Securities, including, without limitation, redemption rights (if any), voting rights or rights to receive dividends and other distributions paid on any of such Underlying Securities. The annual dividend yield on the Portfolio as of November 25, 2022 was 5.28%, representing an aggregate dividend yield of approximately 43.35% compounded annually over the seven-year term, on the assumption that the dividend yield remains constant.

Entity Name	Symbol	Exchange	Portfolio Weight	Closing Prices (as of November 25, 2022)
Canadian Natural Resources Limited	CNQ	TSX	16.667%	80.52
Cenovus Energy Inc.	CVE	TSX	16.667%	27.11
TC Energy Corporation	TRP	TSX	16.667%	65.97
Enbridge Inc.	ENB	TSX	16.667%	55.94
Tourmaline Oil Corp.	TOU	TSX	16.667%	80.38
Suncor Energy Inc.	SU	TSX	16.667%	47.38

Issue Date: December 14, 2022

A final base shelf prospectus containing important information relating to the securities described in this document has been filed with the securities regulatory authorities in each of the provinces and territories of Canada. A copy of the final base shelf prospectus and any amendment to the final base shelf prospectus and any applicable shelf prospectus supplement that has been filed, is required to be delivered with this document. This document does not provide full disclosure of all material facts relating to the securities offered. Investors should read the final base shelf prospectus, any amendment and any applicable shelf prospectus supplement for disclosure of those facts, especially risk factors relating to the securities offered, before making an investment decision.

## KEY TERMS CONTINUED

<b>Maturity Date:</b>	December 14, 2029																															
<b>Initial Portfolio Value:</b>	The “ <b>Initial Portfolio Value</b> ” is the Portfolio Value on November 25, 2022 (the “ <b>Initial Valuation Date</b> ”).																															
<b>Final Portfolio Value:</b>	The “ <b>Final Portfolio Value</b> ” is the Portfolio Value on November 26, 2029 (the “ <b>Final Valuation Date</b> ”).																															
<b>Coupon Barrier Value:</b>	The “ <b>Coupon Barrier Value</b> ” is 70.00% of the Initial Portfolio Value.																															
<b>Protection Barrier Value:</b>	The “ <b>Protection Barrier Value</b> ” is 70.00% of the Initial Portfolio Value.																															
<b>Portfolio Value:</b>	The “Portfolio Value” for the Portfolio on any Exchange Day is calculated by: (a) multiplying (i) the official closing price of each Underlying Security, as announced by the TSX, on such Exchange Days by (ii) the corresponding Number of Underlying Securities for such Underlying Security; and (b) aggregating the resulting products.																															
<b>Number of Underlying Securities:</b>	The “ <b>Number of Underlying Securities</b> ” for each Underlying Security is calculated by: (i) multiplying the Portfolio Weight for such Underlying Security by the aggregate Principal Amount of Securities issued under this offering; and (ii) dividing the resulting product by the official closing price of such Underlying Security, as announced by the TSX, on the Initial Valuation Date.																															
<b>Percentage Change:</b>	The “ <b>Percentage Change</b> ” is the amount, expressed as a percentage rounded to two decimal places, equal to: <div><math display="block">\frac{(\text{Final Portfolio Value} - \text{Initial Portfolio Value})}{\text{Initial Portfolio Value}}</math></div>																															
<b>Observation Dates:</b>	<p>An “<b>Observation Date</b>” for the purposes of determining the amount of any Interest Payment will occur quarterly on the dates specified below in each year that the Securities are outstanding, from and including February 27, 2023 to and including November 26, 2029. If any such Observation Date is not an Exchange Day, it shall be postponed to the next succeeding Exchange Day.</p> <p>Provided that the Securities are not redeemed by the Bank as described below, the Bank intends the Observation Dates to be:</p> <table><tr><td>February 27, 2023</td><td>May 25, 2023</td><td>August 25, 2023</td><td>November 27, 2023</td></tr><tr><td>February 26, 2024</td><td>May 27, 2024</td><td>August 26, 2024</td><td>November 25, 2024</td></tr><tr><td>February 25, 2025</td><td>May 26, 2025</td><td>August 25, 2025</td><td>November 25, 2025</td></tr><tr><td>February 25, 2026</td><td>May 25, 2026</td><td>August 25, 2026</td><td>November 25, 2026</td></tr><tr><td>February 25, 2027</td><td>May 25, 2027</td><td>August 25, 2027</td><td>November 25, 2027</td></tr><tr><td>February 25, 2028</td><td>May 25, 2028</td><td>August 25, 2028</td><td>November 27, 2028</td></tr><tr><td>February 26, 2029</td><td>May 25, 2029</td><td>August 27, 2029</td><td>November 26, 2029</td></tr></table>				February 27, 2023	May 25, 2023	August 25, 2023	November 27, 2023	February 26, 2024	May 27, 2024	August 26, 2024	November 25, 2024	February 25, 2025	May 26, 2025	August 25, 2025	November 25, 2025	February 25, 2026	May 25, 2026	August 25, 2026	November 25, 2026	February 25, 2027	May 25, 2027	August 25, 2027	November 25, 2027	February 25, 2028	May 25, 2028	August 25, 2028	November 27, 2028	February 26, 2029	May 25, 2029	August 27, 2029	November 26, 2029
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<b>Interest Payment Dates:</b>	<p>The “<b>Interest Payment Date</b>” for an Interest Payment, if any, will occur quarterly on the dates specified below in each year that the Securities are outstanding, from and including March 2, 2023 to and including December 14, 2029.</p> <p>Provided that the Securities are not redeemed by the Bank as described below, the Bank intends the Interest Payment Dates to be:</p> <table><tr><td>March 02, 2023</td><td>May 30, 2023</td><td>August 30, 2023</td><td>November 30, 2023</td></tr><tr><td>February 29, 2024</td><td>May 30, 2024</td><td>August 29, 2024</td><td>November 28, 2024</td></tr><tr><td>February 28, 2025</td><td>May 29, 2025</td><td>August 28, 2025</td><td>November 28, 2025</td></tr><tr><td>March 02, 2026</td><td>May 28, 2026</td><td>August 28, 2026</td><td>November 30, 2026</td></tr><tr><td>March 02, 2027</td><td>May 28, 2027</td><td>August 30, 2027</td><td>November 30, 2027</td></tr><tr><td>March 01, 2028</td><td>May 30, 2028</td><td>August 30, 2028</td><td>November 30, 2028</td></tr><tr><td>March 01, 2029</td><td>May 30, 2029</td><td>August 30, 2029</td><td>December 14, 2029</td></tr></table>				March 02, 2023	May 30, 2023	August 30, 2023	November 30, 2023	February 29, 2024	May 30, 2024	August 29, 2024	November 28, 2024	February 28, 2025	May 29, 2025	August 28, 2025	November 28, 2025	March 02, 2026	May 28, 2026	August 28, 2026	November 30, 2026	March 02, 2027	May 28, 2027	August 30, 2027	November 30, 2027	March 01, 2028	May 30, 2028	August 30, 2028	November 30, 2028	March 01, 2029	May 30, 2029	August 30, 2029	December 14, 2029
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<b>Interest Payments:</b>	Interest payments (the “ <b>Interest Payments</b> ” and each, an “ <b>Interest Payment</b> ”), if any, on the Securities will be payable on each Interest Payment Date, in arrears, at a fixed interest rate of 2.6250% quarterly ending on an Interest Payment Date (an “ <b>Interest Period</b> ”) for each Interest Period in which a Digital Payout Event occurs on the Observation Date occurring in the Interest Period. On the basis of the foregoing, the interest on each \$100 Principal Amount of Securities for an Interest Period in which a Digital Payout Event has occurred would equal $\$100 \times 2.6250\%$ .																															

Thus, if a Digital Payout Event occurs:

- (a) on each Observation Date in any twelve-month period, the amount of interest payable on each \$100 Principal Amount of Securities for that twelve-month period will be \$10.50;
- (b) on three out of the four Observation Dates in any twelve-month period, the amount of interest payable on each \$100 Principal Amount of Securities for that twelve-month period will be \$7.875;
- (c) on two out of the four Observation Dates in any twelve-month period, the amount of interest payable on each \$100 Principal Amount of Securities for that twelve-month period will be \$5.25; and
- (d) on one out of the four Observation Dates in any twelve-month period, the amount of interest payable on each \$100 Principal Amount of Securities for that twelve-month period will be \$2.625.

If a Digital Payout Event does not occur on the Observation Date during a particular Interest Period, no interest will be payable on the Securities for such Interest Period.

<b>Digital Payout Event:</b>	A “ <b>Digital Payout Event</b> ” will occur if, on the relevant Observation Date, the Portfolio Value is greater than or equal to the Coupon Barrier Value.	
<b>Autocall Redemption Event:</b>	An “ <b>Autocall Redemption Event</b> ” will occur if the Portfolio Value on an Observation Date other than the first, second, third and last Observation Dates is greater than or equal to 100.00% of the Initial Portfolio Value (the “ <b>Autocall Redemption Value</b> ”). On the next succeeding Interest Payment Date following the occurrence of an Autocall Redemption Event (the “ <b>Autocall Redemption Date</b> ”) the Securities will be redeemed for an amount equal to the Principal Amount thereof (the “ <b>Autocall Redemption Amount</b> ”). In addition to the Autocall Redemption Amount, an Interest Payment will be paid on the Autocall Redemption Date.	
<b>Payment at Maturity:</b>	<p>On the Maturity Date, if the Securities have not been previously redeemed, the amount payable (the “<b>Final Redemption Amount</b>”) for each \$100 Principal Amount per Security will be equal to:</p> <ul style="list-style-type: none"> <li>(a) if the Final Portfolio Value is greater than or equal to the Protection Barrier Value, \$100; or</li> <li>(b) if the Final Portfolio Value is less than the Protection Barrier Value, an amount equal to:  <math display="block">\\$100.00 + (\\$100.00 \times \text{Percentage Change})</math> </li> </ul> <p>In addition to the Final Redemption Amount, an Interest Payment will be paid on the Maturity Date if a Digital Payout Event occurs on the Final Valuation Date. All dollar amounts will be rounded to the nearest whole cent. The minimum payment at maturity is \$1.00.</p>	
<b>Secondary Market:</b>	OTC	
<b>Early Trading Charge Schedule:</b>	<b>If Sold Within the Following No. of Days from Issue Date</b>	<b>Early Trading Charge (% of Principal Amount)</b>
	1 - 45 days	3.00%
	46 - 90 days	2.75%
	91 - 135 days	2.50%
	136 - 180 days	2.00%
	181 - 225 days	1.50%
	226 - 270 days	1.00%
	Thereafter	Nil

## SAMPLE CALCULATIONS OF FINAL REDEMPTION AMOUNT OR AUTOCALL REDEMPTION AMOUNT AND INTEREST PAYMENTS

The examples set out below are included for illustration purposes only. The Portfolio Values used to illustrate the calculation of the Final Redemption Amount or Autocall Redemption Amount and the Interest Payments over the term of the Securities are not estimates or forecasts of the Portfolio Values on which the Percentage Change, and in turn the Final Redemption Amount, Autocall Redemption Amount and Interest Payments, if any, will depend.

### Hypothetical Calculation of the Initial Portfolio Value:

It is assumed that the aggregate Principal Amount of Securities issued under this offering is \$15,000,000.00 and the (hypothetical) closing prices of the Underlying Securities comprising the Portfolio on the Initial Valuation Date are as illustrated in the table below:

Entity Name	Symbol	Closing Price (\$)	Underlying Security Value in Portfolio (\$)	Portfolio Weight	Number of Underlying Securities
Canadian Natural Resources Limited	CNQ	80.52	2,500,000.00	16.667%	31,048.18679
Cenovus Energy Inc.	CVE	27.11	2,500,000.00	16.667%	92,216.89414
TC Energy Corporation	TRP	65.97	2,500,000.00	16.667%	37,896.01334
Enbridge Inc.	ENB	55.94	2,500,000.00	16.667%	44,690.74008
Tourmaline Oil Corp.	TOU	80.38	2,500,000.00	16.667%	31,102.26424
Suncor Energy Inc.	SU	47.38	2,500,000.00	16.667%	52,764.87970

Based on those assumptions, the Initial Portfolio Value would be the sum of the Underlying Security values, which is \$15,000,000.00.

### Hypothetical Calculation of the Final Portfolio Value:

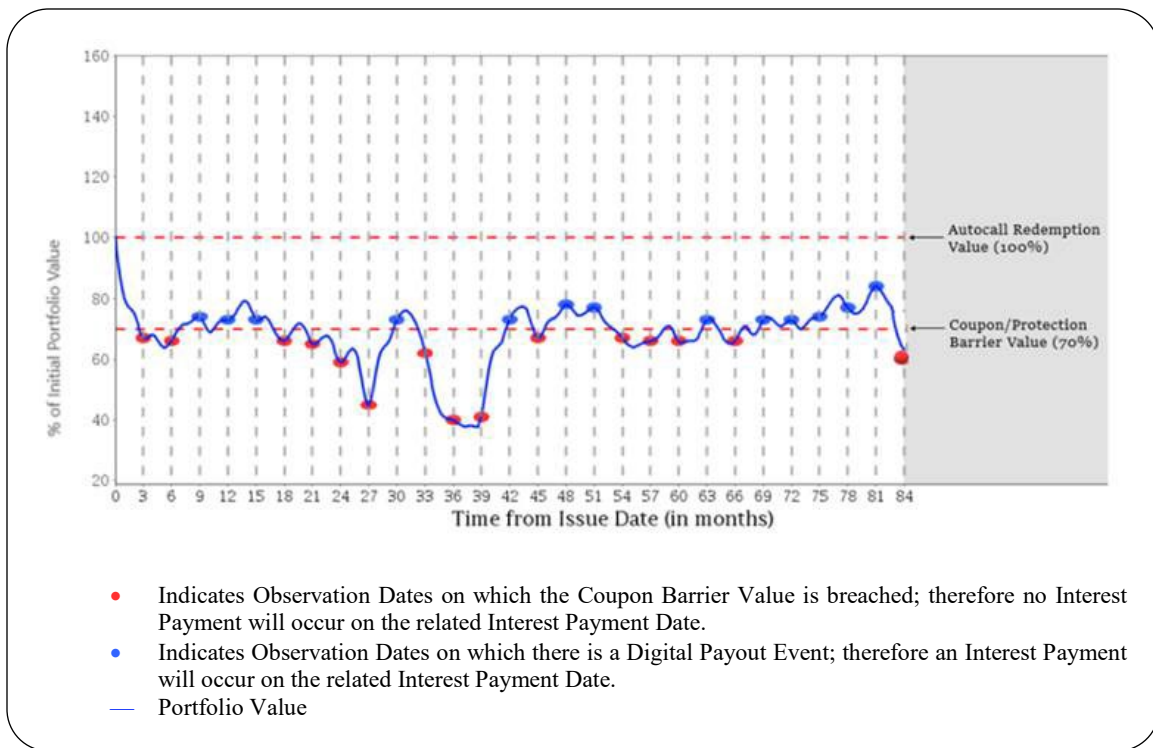
For illustration purposes, it is assumed that no Extraordinary Event has occurred and that the (hypothetical) closing prices of the Underlying Securities comprising the Portfolio on the Final Valuation Date are as illustrated in the table below. For the purposes of the following table, certain dollar values have been rounded to two decimal places.

Entity Name	Symbol	Closing Price (\$)	Number of Underlying Securities	Underlying Security Value in Portfolio (\$)
Canadian Natural Resources Limited	CNQ	98.64	31,048.18679	3,062,593.14
Cenovus Energy Inc.	CVE	33.21	92,216.89414	3,062,523.05
TC Energy Corporation	TRP	80.81	37,896.01334	3,062,376.84
Enbridge Inc.	ENB	68.53	44,690.74008	3,062,656.42
Tourmaline Oil Corp.	TOU	98.47	31,102.26424	3,062,639.96
Suncor Energy Inc.	SU	58.04	52,764.87970	3,062,473.62

Based on those assumptions, the Final Portfolio Value would be the sum of the Underlying Security values, which \$18,375,263.03.

All examples below assume that a holder of the Securities has purchased Securities with an aggregate principal amount of \$100.00, that no Extraordinary Event has occurred, an Autocall Redemption Value of 100.00% of the Initial Portfolio Value, a Coupon Barrier Value of 70.00% of the Initial Portfolio Value and a Protection Barrier Value of 70.00% of the Initial Portfolio Value. For convenience, each vertical line in the charts below represents both a hypothetical Observation Date and the next succeeding Interest Payment Date. All dollar amounts are rounded to the nearest whole cent.

### Example #1: Loss Scenario with Payment on the Maturity Date at Less Than the Principal Amount



In this scenario, there is no Observation Date on which the Portfolio Value is at or above the Autocall Redemption Value and, accordingly, the Securities would not be redeemed before the Maturity Date. On the Final Valuation Date, the Final Portfolio Value is below the Protection Barrier Value.

#### (i) Interest Payments

In this example, there is a Digital Payout Event on 13 of the 28 Observation Dates. On the other 15 Observation Dates, no Digital Payout Event would occur because the Portfolio Value is below the Coupon Barrier Value. Therefore, the Interest Payment of \$2.625 per Interest Period would be payable for 5 Interest Periods on the applicable Interest Payment Date, for total Interest Payments of:

$$\begin{aligned} & \text{Principal Amount of Securities} \times 2.6250\% \text{ per Interest Period} \times 13 \text{ Interest Periods} \\ & \$100 \times 2.6250\% \times 13 = \$34.13 \end{aligned}$$

#### (ii) Final Redemption Amount

In this example, the Initial Portfolio Value ( $X_i$ ) is \$15,000,000.00 and the Final Portfolio Value ( $X_f$ ) is \$9,000,000.00. Therefore, the Final Redemption Amount would be calculated as follows:

Initial Portfolio Value = \$15,000,000.00

Final Portfolio Value = \$9,000,000.00

Percentage Change =  $(\$9,000,000.00 - \$15,000,000.00) / \$15,000,000.00 = -0.4000$  or  $-40.00\%$

Since the Final Portfolio Value is below the Protection Barrier Value, the Final Redemption Amount is calculated as follows:

Final Redemption Amount =  $\$100.00 + (\$100.00 \times -40.00\%) = \$60.00$

Therefore, the total amounts payable per Security from the Issue Date to the Maturity Date are:

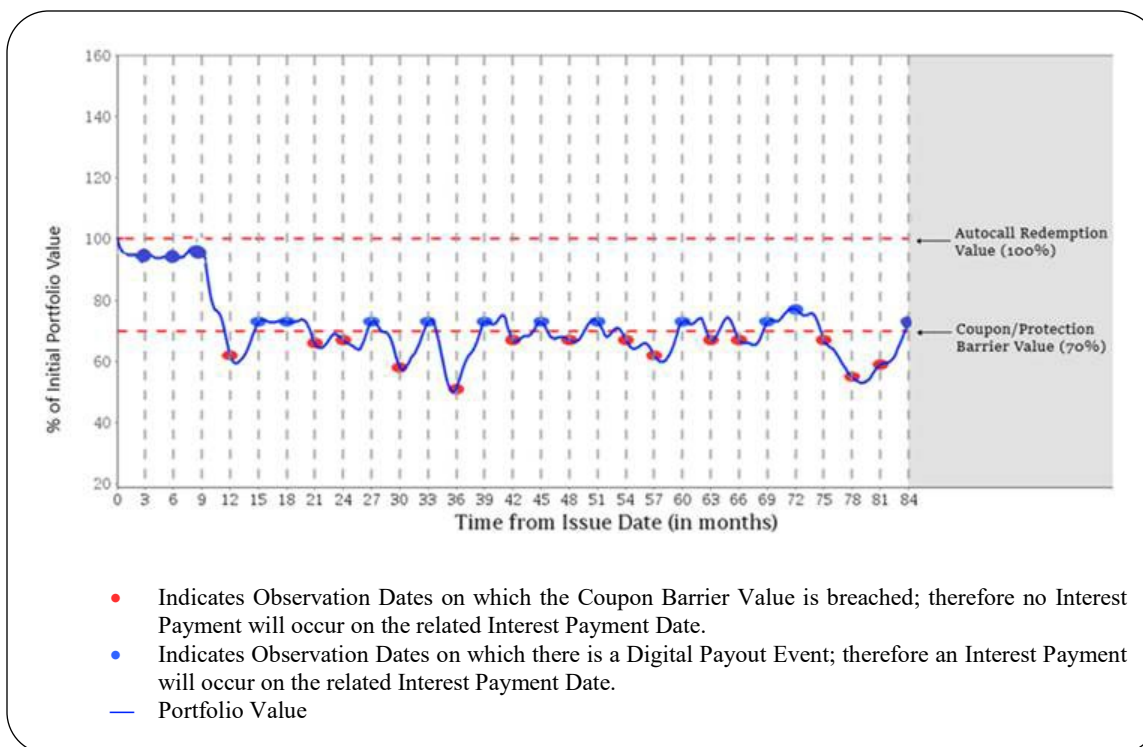
(a) Total Interest Payments: \$34.13

(b) Final Redemption Amount: \$60.00

(c) Total amount paid over the term of the Securities: \$94.13

The equivalent annually compounded rate of return in this example is  $-0.86\%$ .

## Example #2: Gain Scenario with Payment on the Maturity Date at the Principal Amount



In this scenario, there is no Observation Date on which the Portfolio Value is at or above the Autocall Redemption Value and, accordingly, the Securities would not be redeemed before the Maturity Date. On the Final Valuation Date, the Final Portfolio Value is at or above the Protection Barrier Value.

### (i) Interest Payments

In this example, there is a Digital Payout Event on 14 of the 28 Observation Dates. On the other 14 Observation Dates, no Digital Payout Event would occur because the Portfolio Value is below the Coupon Barrier Value. Therefore, the Interest Payment of \$2.625 per Interest Period would be payable for 14 Interest Periods on the applicable Interest Payment Date for total Interest Payments of:

$$\begin{aligned} & \text{Principal Amount of Securities} \times 2.6250\% \text{ per Interest Period} \times 14 \text{ Interest Periods} \\ & \$100 \times 2.6250\% \times 14 = \$36.75 \end{aligned}$$

### (ii) Final Redemption Amount

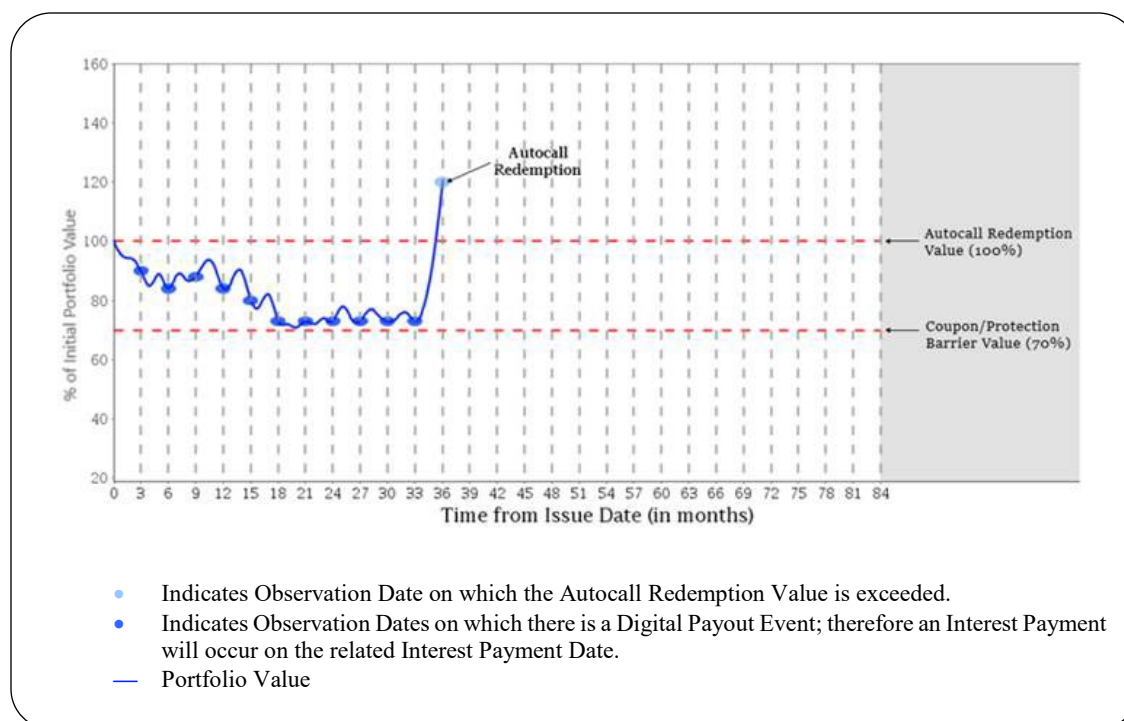
In this example, since the Final Portfolio Value is \$11,250,000.00, which is above its Protection Barrier Value of 70.00% of the Initial Portfolio Value of \$15,000,000.00, the Final Redemption Amount per Security is equal to \$100.00.

Therefore, the total amounts payable per Security from the Issue Date to the Maturity Date are:

- (a) Total Interest Payments: \$36.75
- (b) Final Redemption Amount: \$100.00
- (c) Total amount paid over the term of the Securities: \$136.75

The equivalent annually compounded rate of return in this example is 4.57%.

### Example #3: Gain Scenario with Autocall Redemption Event



In this scenario, the Portfolio Value is at or above the Autocall Redemption Value on the Observation Date that falls 36 months into the term of the Securities. This would constitute an Autocall Redemption Event and, on the next succeeding Interest Payment Date, the Bank would redeem the Securities.

#### (i) Interest Payments

In this example, there is a Digital Payout Event on each of the 12 Observation Dates prior to the redemption of the Securities because the Portfolio Value is at or above the Coupon Barrier Value on each such date. Therefore, the Interest Payment of \$2.625 per Interest Period would be payable for each Interest Period on the applicable Interest Payment Date (including on the Autocall Redemption Date), for total Interest Payments of:

$$\begin{aligned} & \text{Principal Amount of Securities} \times 2.6250\% \text{ per Interest Period} \times 12 \text{ Interest Periods} \\ & \$100 \times 2.6250\% \times 12 = \$31.50 \end{aligned}$$

#### (ii) Autocall Redemption Amount

The Autocall Redemption Amount per Security is equal to \$100.00.

Therefore, the total amounts payable per Security from the Issue Date to the Autocall Redemption Date are:

(a) Total Interest Payments: \$31.50

(b) Autocall Redemption Amount: \$100.00

(c) Total amount paid over the term of the Securities: \$131.50

The equivalent annually compounded rate of return in this example is 9.56%.



<b>Initial Estimated Value:</b>	The initial estimated value of the Securities as of November 25, 2022 was \$94.94 per Security, which is less than the price to the public and is not an indication of the actual profit to the Bank or its affiliates. The actual value of the Securities at any time will reflect many factors, cannot be predicted with accuracy, and may be less than this amount. The initial estimated value of the Securities is an estimate only and is based on the value of the Bank's obligation to make the payments on the Securities. We describe our determination of the initial estimated value in more detail in the Pricing Supplement.
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All capitalized terms unless otherwise defined have the meanings ascribed to them in the Pricing Supplement.

Clients should evaluate the financial, market, legal, regulatory, credit, tax and accounting risks and consequences of the proposal before entering into any transaction, or purchasing any instrument. Clients should evaluate such risks and consequences independently of Royal Bank of Canada and the Dealers, RBC Dominion Securities Inc. and Richardson Wealth Limited, respectively.

The Securities will not constitute deposits insured under the *Canada Deposit Insurance Corporation Act*. The Securities are not fixed income securities and are not designed to be alternatives to fixed income or money market instruments. The Securities are structured products that possess downside risk.

An investment in the Securities involves risks. An investment in the Securities is not the same as a direct investment in the securities that comprise the Portfolio and investors have no rights with respect to the securities in the Portfolio. The Securities are considered to be "specified derivatives" under applicable Canadian securities laws. If you purchase Securities, you will be exposed to fluctuations in interest rates and changes in the Portfolio Value, among other factors. Price changes may be volatile and an investment in the Securities may be considered to be speculative. Since the Securities are not principal protected and the Principal Amount will be at risk, you could lose substantially all of your investment.

