

ROYAL BANK OF CANADA  
Form 424B2  
October 31, 2018

RBC Capital Markets® Filed Pursuant to Rule 424(b)(2)  
Registration Statement No. 333-227001

Pricing Supplement

Dated October 29, 2018

To the Product \$1,038,000

Prospectus Supplement Absolute Return Barrier Notes Linked to  
ERN-ETF-1 Dated the SPDR® S&P® 500 ETF Trust, due  
September 11, 2018, August 3, 2021

Prospectus Supplement Royal Bank of Canada

Dated September 7,

2018, and Prospectus

Dated September 7, 2018

Royal Bank of Canada is offering the Absolute Return Barrier Notes (the “Notes”) linked to the performance of the SPDR® S&P® 500 ETF Trust (the “Reference Asset”).

The CUSIP number for the Notes is 78013GGY5. The Notes do not pay interest. Any payments on the Notes are subject to our credit risk. The Notes will not be listed on any securities exchange.

The Notes provide a one-for-one return of \$1,000 of the principal amount if the Final Level of the Reference Asset is greater than its Initial Level, up to a Maximum Redemption Amount of 124.00% of the principal amount. If the Final Level is less than the Initial Level, but is not less than 75% of the Initial Level (the “Barrier Level”), the Notes will provide a one-for-one positive return for each 1% decrease in the level of the Reference Asset. However, investors will receive shares of the Reference Asset at maturity if the Final Level is less than the Barrier Level, and the value of these shares is expected to be significantly less than the principal amount of the Notes, as further described below.

Accordingly, investors may lose all or a significant portion of their principal amount.

Issue Date: November 1, 2018

Maturity Date: August 3, 2021

Investing in the Notes involves a number of risks. See “Risk Factors” beginning on page S-1 of the prospectus supplement dated September 7, 2018, “Additional Risk Factors Specific to the Notes” beginning on page PS-6 of the product prospectus supplement dated September 11, 2018, and “Selected Risk Considerations” beginning on page P-7 of this pricing supplement.

The Notes will not constitute deposits insured by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation or any other Canadian or U.S. government agency or instrumentality. The Notes are not subject to conversion into our common shares under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act. Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of the Notes or determined that this pricing supplement is truthful or complete. Any representation to the contrary is a criminal offense.

	Per Note	Total
Price to public	100.00%	\$1,038,000
Underwriting discounts and commissions <sup>(1)</sup>	2.25%	\$23,355
Proceeds to Royal Bank of Canada	97.75%	\$1,014,645

<sup>(1)</sup> The underwriting fee is \$22.50 per security. RBCCM, acting as agent for Royal Bank of Canada, paid the entire fee to Citigroup Global Markets Inc. (“CGMI”) as a sales commission for each security that CGMI sold. See “Supplemental Plan of Distribution (Conflicts of Interest)” below.

The initial estimated value of the Notes as of the date of this pricing supplement is \$953.18 per \$1,000 in principal amount, which is less than the price to public. The actual value of the Notes at any time will reflect many factors, cannot be predicted with accuracy, and may be less than this amount. We describe our determination of the initial estimated value in more detail below.

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SUMMARY

The information in this “Summary” section is qualified by the more detailed information set forth in this pricing supplement, the product prospectus supplement, the prospectus supplement, and the prospectus.

Issuer: Royal Bank of Canada (“Royal Bank”)  
Issue: Senior Global Medium-Term Notes, Series H  
Underwriter: RBC Capital Markets, LLC  
Reference Asset: The SPDR® S&P® 500 ETF Trust (Bloomberg symbol: SPY)  
Currency: U.S. Dollars  
Minimum Investment: \$1,000 and minimum denominations of \$1,000 in excess thereof  
Pricing Date: October 29, 2018  
Issue Date: November 1, 2018  
CUSIP: 78013GGY5  
Valuation Date: July 29, 2021

If, on the Valuation Date, the Final Level is greater than or equal to the Initial Level, then the investor will receive the lesser of:

- $\$1,000 + (\$1,000 \times \text{Percentage Change})$
- the Maximum Redemption Amount

Payment at Maturity (if held to maturity):

If, on the Valuation Date, the Final Level is less than the Initial Level, but greater than or equal to the Barrier Level, then the investor will receive an amount calculated as follows:  
 $\$1,000 + [-1 \times (\$1,000 \times \text{Percentage Change})]$

In this case, the return on the Notes will be positive, even though the price of the Reference Asset has decreased.

However, if, on the Valuation Date, the Final Level is less than the Barrier Level, then the investor will receive at maturity, for each \$1,000 in principal amount, a number of shares of the Reference Asset equal to the Physical Delivery Amount (or at our election, the cash value of those shares).

In this case, you will lose a significant portion, or possibly even all, of the principal amount.

Percentage Change:

The Percentage Change, expressed as a percentage, is calculated using the following formula:

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Physical Delivery Amount:	For each \$1,000 in principal amount, a number of shares of the Reference Asset equal to the principal amount divided by the Initial Level, subject to adjustment as described in the product prospectus supplement. If this number is not a round number, then the number of shares of the Reference Asset to be delivered will be rounded down and the fractional part shall be paid in cash.
Cash Delivery Amount:	The product of the Physical Delivery Amount multiplied by the Final Level
Initial Level:	\$263.86, which was the closing price of the Reference Asset on the Pricing Date.
Final Level:	The closing price of the Reference Asset on the Valuation Date.
Maximum Redemption Amount:	124% multiplied by the principal amount
Barrier Level:	\$197.90, which is 75% of the Initial Level, rounded to two decimal places
Maturity Date:	August 3, 2021, subject to extension for market and other disruptions, as described in the product prospectus supplement.
Principal at Risk:	The Notes are NOT principal protected. You may lose all or a substantial portion of your principal amount at maturity if the Final Level is less than the Barrier Level.
Calculation Agent:	RBCCM
U.S. Tax Treatment:	By purchasing a Note, each holder agrees (in the absence of a change in law, an administrative determination or a judicial ruling to the contrary) to treat the Notes as a pre-paid derivative contract for U.S. federal income tax purposes. However, the U.S. federal income tax consequences of your investment in the Notes are uncertain and the Internal Revenue Service could assert that the Notes should be taxed in a manner that is different from that described in the preceding sentence. Please see the section below, “Supplemental Discussion of U.S. Federal Income Tax Consequences,” and the discussion (including the opinion of our counsel Morrison & Foerster LLP) in the product prospectus supplement dated September 11, 2018 under “Supplemental Discussion of U.S. Federal Income Tax Consequences,” which apply to the Notes.
Secondary Market:	RBCCM (or one of its affiliates), though not obligated to do so, may maintain a secondary market in the Notes after the Issue Date. The amount that you may receive upon sale of your Notes prior to maturity may be less than the principal amount of your Notes.
Listing:	The Notes will not be listed on any securities exchange.
Clearance and Settlement:	DTC global (including through its indirect participants Euroclear and Clearstream, Luxembourg as described under “Description of Debt Securities—Ownership and Book-Entry Issuance” in the prospectus dated September 7, 2018).
Terms Incorporated in the Master Note:	All of the terms appearing above the item captioned “Secondary Market” on the cover page and pages P-2 and P-3 of this pricing supplement and the terms appearing under the caption “General Terms of the Notes” in the product prospectus supplement, as modified by this pricing supplement.

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#### ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated September 7, 2018, as supplemented by the prospectus supplement dated September 7, 2018 and the product prospectus supplement dated September 11, 2018, relating to our Senior Global Medium-Term Notes, Series H, of which these Notes are a part. Capitalized terms used but not defined in this pricing supplement will have the meanings given to them in the product prospectus supplement. In the event of any conflict, this pricing supplement will control. The Notes vary from the terms described in the product prospectus supplement in several important ways. For example, you may receive shares of the Reference Asset at maturity. You should read this pricing supplement carefully.

This pricing supplement, together with the documents listed below, contains the terms of the Notes and supersedes all prior or contemporaneous oral statements as well as any other written materials including preliminary or indicative pricing terms, correspondence, trade ideas, structures for implementation, sample structures, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in “Risk Factors” in the prospectus supplement dated September 7, 2018 and “Additional Risk Factors Specific to the Notes” in the product prospectus supplement dated September 11, 2018, as the Notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the Notes. You may access these documents on the Securities and Exchange Commission (the “SEC”) website at [www.sec.gov](http://www.sec.gov) as follows (or if that address has changed, by reviewing our filings for the relevant date on the SEC website):

Prospectus dated September 7, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000121465918005973/196181424b3.htm>

Prospectus Supplement dated September 7, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000121465918005975/f97180424b3.htm>

Product Prospectus Supplement ERN-ETF-1 dated September 11, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000114036118038211/form424b5.htm>

Our Central Index Key, or CIK, on the SEC website is 1000275. As used in this pricing supplement, “we,” “us,” or “our” refers to Royal Bank of Canada.

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#### HYPOTHETICAL RETURNS

The examples below are based on the following terms:

Hypothetical Initial Level: \$100.00\*  
Hypothetical Barrier Level: \$75.00, which is 75.00% of the hypothetical Initial Level  
Maximum Redemption Amount: 124% multiplied by the principal amount  
Principal Amount: \$1,000 per Note

\* The hypothetical Initial Level of \$100 used in the examples below has been chosen for illustrative purposes only and is not the expected actual Initial Level. The actual Initial Level will be set forth on the cover page of the final pricing supplement relating to the Notes.

Final Level	Reference Asset Return	Asset Payment at Maturity	Physical Delivery Amount as Number of Shares of the Reference Asset	Cash Delivery Amount
\$150.00	50.00%	\$1,240.00	n/a	n/a
\$140.00	40.00%	\$1,240.00	n/a	n/a
\$130.00	30.00%	\$1,240.00	n/a	n/a
\$124.00	24.00%	\$1,240.00	n/a	n/a
\$120.00	20.00%	\$1,200.00	n/a	n/a
\$115.00	15.00%	\$1,150.00	n/a	n/a
\$110.00	10.00%	\$1,100.00	n/a	n/a
\$105.00	5.00%	\$1,050.00	n/a	n/a
\$100.00	0.00%	\$1,000.00	n/a	n/a
\$95.00	-5.00%	\$1,050.00	n/a	n/a
\$90.00	-10.00%	\$1,100.00	n/a	n/a
\$85.00	-15.00%	\$1,150.00	n/a	n/a
\$80.00	-20.00%	\$1,200.00	n/a	n/a
\$75.00	-25.00%	\$1,250.00	n/a	n/a
\$74.99	-25.01%	Physical or Cash Delivery Amount	10	\$749.90
\$70.00	-30.00%	Physical or Cash Delivery Amount	10	\$700.00
\$60.00	-40.00%	Physical or Cash Delivery Amount	10	\$600.00
\$50.00	-50.00%	Physical or Cash Delivery Amount	10	\$500.00
\$40.00	-60.00%	Physical or Cash Delivery Amount	10	\$400.00
\$30.00	-70.00%	Physical or Cash Delivery Amount	10	\$300.00
\$20.00	-80.00%	Physical or Cash Delivery Amount	10	\$200.00
\$10.00	-90.00%	Physical or Cash Delivery Amount	10	\$100.00
\$0.00	-100.00%	Physical or Cash Delivery Amount	10	\$0.00

The following examples illustrate how the payments at maturity are calculated:

Example 1: The price of the Reference Asset increases to a Final Level of \$150.00.

Because the Final Level is greater than the Initial Level, but the Percentage Change is greater than 24%, an investor will receive at maturity a payment of \$1,240.00 per \$1,000 in principal amount of the Notes, equal to the Maximum Redemption Amount.

Example 2: The price of the Reference Asset increases to a Final Level of \$112.00.

Because the Final Level is greater than the Initial Level, but the Percentage Change is not greater than 24%, an investor will receive at maturity a payment of \$1,120 per \$1,000 in principal amount of the Notes, calculated as follows:

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Principal Amount + (Principal Amount x Percentage Change) = \$1,000 + (\$1,000 x 12%) = \$1,120

Example 3: The price of the Reference Asset decreases to a Final Level of \$90.00.

Although the Final Level is less than the Initial Level, the Final Level is above the Barrier Level. Because the Final Level is above the Barrier Level, an investor will receive at maturity a payment of \$1,100 per \$1,000 in principal amount of the Notes, which is greater than the principal amount

Example 4: The price of the Reference Asset decreases to a Final Level of \$40.00.

Because the Final Level is less than the Barrier Level, the investor will receive 10 shares of the Reference Asset at maturity, or at our option, the Cash Delivery Amount, calculated as follows:

Physical Delivery Amount x Final Level = 10 x \$40 = \$400.00

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#### SELECTED RISK CONSIDERATIONS

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the Reference Asset. These risks are explained in more detail in the section “Additional Risk Factors Specific to the Notes,” beginning on page PS-4 of the product prospectus supplement. In addition to the risks described in the prospectus supplement and the product prospectus supplement, you should consider the following:

**Principal at Risk** — Investors in the Notes could lose all or a substantial portion of their principal amount if the share price of the Reference Asset decreases. If the Final Level is less than the Barrier Level, the amount of cash or the value of the shares that you receive is expected to be less than 25% of the principal amount, and could even be zero. Further, if you receive shares of the Reference Asset, they could further decline in value between the Valuation Date and the maturity date.

**The Notes Do Not Pay Interest and Your Return May Be Lower than the Return on a Conventional Debt Security of Comparable Maturity** — There will be no periodic interest payments on the Notes as there would be on a conventional fixed-rate or floating-rate debt security having the same maturity. The return that you will receive on the Notes, which could be negative, may be less than the return you could earn on other investments. Even if your return is positive, your return may be less than the return you would earn if you bought a conventional senior interest bearing debt security of Royal Bank.

**Your Potential Payment at Maturity Is Limited** — The Notes will provide less opportunity to participate in the appreciation of the Reference Asset than an investment in a security linked to the Reference Asset providing full participation in the appreciation, because the payment at maturity will not exceed the Maximum Redemption Amount. In addition, the value of any payment that you receive at maturity will not reflect any dividends paid on the Reference Asset. Accordingly, any positive return you receive on the Notes is expected to be less than your return would be if you made an investment in the Reference Asset or a security directly linked to the positive performance of the Reference Asset.

**Payments on the Notes Are Subject to Our Credit Risk, and Changes in Our Credit Ratings Are Expected to Affect the Market Value of the Notes** — The Notes are Royal Bank’s senior unsecured debt securities. As a result, your receipt of the amount due on the maturity date is dependent upon Royal Bank’s ability to repay its obligations at that time. This will be the case even if the share price of the Reference Asset increases after the Pricing Date. No assurance can be given as to what our financial condition will be at the maturity of the Notes.

**There May Not Be an Active Trading Market for the Notes—Sales in the Secondary Market May Result in Significant Losses** — There may be little or no secondary market for the Notes. The Notes will not be listed on any securities exchange. RBCCM and other affiliates of Royal Bank may make a market for the Notes; however, they are not required to do so. RBCCM or any other affiliate of Royal Bank may stop any market-making activities at any time. Even if a secondary market for the Notes develops, it may not provide significant liquidity or trade at prices advantageous to you. We expect that transaction costs in any secondary market would be high. As a result, the difference between bid and asked prices for your Notes in any secondary market could be substantial.

**You Will Not Have Any Rights to the Securities Included in the Reference Asset** — As a holder of the Notes, you will not have voting rights or rights to receive cash dividends or other distributions or other rights that holders of securities included in the Reference Asset would have. The Final Level will not reflect any dividends paid on the securities included in the Reference Asset, and accordingly, any positive return on the Notes may be less than the potential positive return on those securities.

**The Initial Estimated Value of the Notes Is Less than the Price to the Public** – The initial estimated value set forth on the cover page of this pricing supplement does not represent a minimum price at which we, RBCCM or any of our affiliates would be willing to purchase the Notes in any secondary market (if any exists) at any time. If you attempt to sell the Notes prior to maturity, their market value may be lower than the price you paid for them and the initial



estimated value. This is due to, among other things, changes in the share price of the Reference Asset, the borrowing rate we pay to issue securities of this kind, and the inclusion in the price to the public of the estimated costs relating to our hedging of the Notes. These factors, together with various credit, market and economic factors over the term of the Notes, are expected to reduce the price at which you may be able to sell the Notes in any secondary market and will affect the value of the Notes in complex and unpredictable ways. Assuming no change in market conditions or any other relevant factors, the price, if any, at which you may be able to sell your Notes prior to maturity may be less than your original purchase price, as any such sale price would not be expected to include the hedging costs relating to the Notes. In addition to bid-ask spreads, the value of the Notes determined for any secondary market price is expected to be based on the secondary rate rather than the internal funding rate used to price the Notes and determine the initial estimated value. As a result, the secondary price will be less than if the

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internal funding rate was used. The Notes are not designed to be short-term trading instruments. Accordingly, you should be able and willing to hold your Notes to maturity.

The Initial Estimated Value of the Notes on the Cover Page of this Pricing Supplement Is an Estimate Only, Calculated as of the Time the Terms of the Notes Were Set –The initial estimated value of the Notes is based on the value of our obligation to make the payments on the Notes, together with the mid-market value of the derivative embedded in the terms of the Notes. See “Structuring the Notes” below. Our estimate is based on a variety of assumptions, including our credit spreads, expectations as to dividends, interest rates and volatility, and the expected term of the Notes. These assumptions are based on certain forecasts about future events, which may prove to be incorrect. Other entities may value the Notes or similar securities at a price that is significantly different than we do. The value of the Notes at any time after the Pricing Date will vary based on many factors, including changes in market conditions, and cannot be predicted with accuracy. As a result, the actual value you would receive if you sold the Notes in any secondary market, if any, should be expected to differ materially from the initial estimated value of your Notes.

**Market Disruption Events and Adjustments** — The payment at maturity and the Valuation Date are subject to adjustment as described in the product prospectus supplement. For a description of what constitutes a market disruption event as well as the consequences of that market disruption event, see “General Terms of the Notes—Market Disruption Events” in the product prospectus supplement.

**Changes that Affect the Underlying Index Will Affect the Market Value of the Notes and the Amount You Will Receive at Maturity** — The policies of the sponsor of the Underlying Index (the “Index Sponsor”), concerning the calculation of the Underlying Index, additions, deletions or substitutions of the components of the Underlying Index and the manner in which changes affecting those components, such as stock dividends, reorganizations or mergers, may be reflected in the Underlying Index and, therefore, could affect the share price of the Reference Asset, the amount payable on the Notes at maturity, and the market value of the Notes prior to maturity. The amount payable on the Notes and their market value could also be affected if the Index Sponsor changes these policies, for example, by changing the manner in which it calculates the Underlying Index, or if the sponsor discontinues or suspends the calculation or publication of the Underlying Index.

**Adjustments to the Reference Asset Could Adversely Affect the Notes** — The investment advisor (the “Advisor”) of the Reference Asset is responsible for calculating and maintaining the Reference Asset. The Advisor can add, delete or substitute the stocks comprising the Reference Asset. The Advisor may make other methodological changes that could change the share price of the Reference Asset at any time. If one or more of these events occurs, the calculation of the amount payable at maturity may be adjusted to reflect such event or events. Consequently, any of these actions could adversely affect the amount payable at maturity and/or the market value of the Notes.

**We Have No Affiliation with the Index Sponsor and Will Not Be Responsible for Any Actions Taken by the Index Sponsor** — The Index Sponsor is not an affiliate of ours or of CGMI, and will not be involved in the offering of the Notes in any way. Consequently, we have no control over the actions of the Index Sponsor, including any actions of the type that would require the calculation agent to adjust the payment to you at maturity. The Index Sponsor has no obligation of any sort with respect to the Notes. Thus, the Index Sponsor has no obligation to take your interests into consideration for any reason, including in taking any actions that might affect the value of the Notes. None of our proceeds from the issuance of the Notes will be delivered to the Index Sponsor.

**We and Our Affiliates Do Not Have Any Affiliation with the Advisor and Are Not Responsible for its Public Disclosure of Information** — We, CGMI and our respective affiliates are not affiliated with Advisor in any way and have no ability to control or predict its actions, including any errors in or discontinuance of disclosure regarding its methods or policies relating to the Reference Asset. The Advisor is not involved in the offering of the Notes in any way and has no obligation to consider your interests as an owner of the Notes in taking any actions relating to the Reference Asset that might affect the value of the Notes. None of us, CGMI or any of our respective affiliates has

independently verified the adequacy or accuracy of the information about the Advisor or the Reference Asset contained in any public disclosure of information. You, as an investor in the Notes, should make your own investigation into the Reference Asset.

**The Correlation Between the Performance of the Reference Asset and the Performance of the Underlying Index May Be Imperfect** — The performance of the Reference Asset is linked principally to the performance of the Underlying Index. However, because of the potential discrepancies identified in more detail in the product prospectus supplement, the return on the Reference Asset may correlate imperfectly with the return on the Underlying Index. During periods of market volatility, securities held by the Reference Asset may be unavailable in the secondary market, market participants may be unable to calculate accurately its net asset value per share and its liquidity may be adversely affected.

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This kind of market volatility may also disrupt the ability of market participants to create and redeem shares of the Reference Asset. Further, market volatility may adversely affect, sometimes materially, the prices at which market participants are willing to buy and sell shares of the Reference Asset. As a result, under these circumstances, the market value of shares of the Reference Asset may vary substantially from the applicable net asset value per share. For all of the foregoing reasons, the performance of the Reference Asset may not correlate with the performance of the Underlying Index as well as its net asset value per share, which could materially and adversely affect the value of the Notes in the secondary market and/or reduce the payments on the Notes.

**The Reference Asset Is Subject to Management Risks** — The Reference Asset is subject to management risk, which is the risk that the Advisor's investment strategy, the implementation of which is subject to a number of constraints, may not produce the intended results. For example, the Advisor may invest a portion of the Reference Asset's assets in securities not included in the relevant industry or sector but which the Advisor believes will help the Reference Asset track the relevant industry or sector.

**Our Business Activities May Create Conflicts of Interest** — We, CGMI and our respective affiliates expect to engage in trading activities related to the Reference Asset or the securities held by the Reference Asset that are not for the account of holders of the Notes or on their behalf. These trading activities may present a conflict between the holders' interests in the Notes and the interests we, CGMI and our respective affiliates will have in their proprietary accounts, in facilitating transactions, including options and other derivatives transactions, for their customers and in accounts under their management. These trading activities, if they influence the prices of the Reference Asset, could be adverse to the interests of the holders of the Notes. We, CGMI and one or more of our respective affiliates may, at present or in the future, engage in business with the issuers of the securities held by the Reference Asset, including making loans to or providing advisory services. These services could include investment banking and merger and acquisition advisory services. These activities may present a conflict between our or one or more of our affiliates' obligations and your interests as a holder of the Notes. Moreover, we, CGMI and our respective affiliates may have published, and in the future expect to publish, research reports with respect to the Reference Asset. This research is modified from time to time without notice and may express opinions or provide recommendations that are inconsistent with purchasing or holding the Notes. Any of these activities by us, CGMI or one or more of our affiliates may affect the price of the Reference Asset, and, therefore, the market value of the Notes.

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#### INFORMATION REGARDING THE REFERENCE ASSET

Information provided to or filed with the SEC by the Reference Asset under the Securities Act of 1933, as amended, and the Investment Company Act of 1940, as amended, can be located by reference to SEC file numbers 033-46080 and 811-06125 for the SPY through the SEC's website at <http://www.sec.gov>. In addition, information may be obtained from other sources including, but not limited to, press releases, newspaper articles and other publicly disseminated documents. We have not participated in the preparation of, or verified, such publicly available information. None of the forgoing documents or filings are incorporated by reference in, and should not be considered part of, this document.

The following information regarding the Reference Asset is derived from publicly available information.

We have not independently verified the accuracy or completeness of reports filed by the Reference Asset with the SEC, information published by it on its websites or in any other format, information about it obtained from any other source or the information provided below.

The Notes are not sponsored, endorsed, sold or promoted by the Reference Asset's investment adviser. The investment adviser makes no representations or warranties to the owners of the Notes or any member of the public regarding the advisability of investing in the Notes. The investment adviser has no obligation or liability in connection with the operation, marketing, trading or sale of the Notes.

The shares of the SPDR® S&P 500® ETF trade on the NYSE Arca under the symbol "SPY." The SPY's investment adviser is State Street Global Advisors.

The SPY seeks to provide investment results that correspond generally to the price and yield performance, before fees and expenses, of the S&P 500® Index (the "SPX Index"). To maintain the correspondence between the composition and weightings of stocks held by the SPY and component stocks of the SPX Index, the SPY adjusts its holdings from time to time to conform to periodic changes in the identity and/or relative weightings of the index securities.

The SPY utilizes a "passive" or "indexing" investment approach in attempting to track the performance of the SPX Index. The SPY seeks to invest in substantially all of the securities that comprise the SPX Index. The SPY typically earns income from dividends from securities that it holds. These amounts, net of expenses and taxes (if applicable), are passed along to the SPY's shareholders as "ordinary income." In addition, the SPY realizes capital gains or losses whenever it sells securities. Net long-term capital gains are distributed to shareholders as "capital gain distributions." S&P 500® Index ("SPX")

The SPX Index is intended to provide an indication of the pattern of common stock price movement. The calculation of the level of the SPX Index is based on the relative value of the aggregate market value of the common stocks of 500 companies as of a particular time compared to the aggregate average market value of the common stocks of 500 similar companies during the base period of the years 1941 through 1943.

S&P calculates the SPX Index by reference to the prices of the constituent stocks of the SPX Index without taking account of the value of dividends paid on those stocks. As a result, the return on the Notes will not reflect the return you would realize if you actually owned the SPX Index constituent stocks and received the dividends paid on those stocks.

Effective with the September 2015 rebalance, consolidated share class lines will no longer be included in the SPX Index. Each share class line will be subject to public float and liquidity criteria individually, but the company's total market capitalization will be used to evaluate each share class line. This may result in one listed share class line of a company being included in the SPX Index while a second listed share class line of the same company is excluded.

#### Computation of the SPX Index

While S&P currently employs the following methodology to calculate the SPX Index, no assurance can be given that S&P will not modify or change this methodology in a manner that may affect the Payment at Maturity.

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Historically, the market value of any component stock of the SPX Index was calculated as the product of the market price per share and the number of then outstanding shares of such component stock. In March 2005, S&P began shifting the SPX Index halfway from a market capitalization weighted formula to a float-adjusted formula, before moving the SPX Index to full float adjustment on September 16, 2005. S&P's criteria for selecting stocks for the SPX Index did not change with the shift to float adjustment. However, the adjustment affects each company's weight in the SPX Index.

Under float adjustment, the share counts used in calculating the SPX Index reflect only those shares that are available to investors, not all of a company's outstanding shares. Float adjustment excludes shares that are closely held by control groups, other publicly traded companies or government agencies.

In September 2012, all shareholdings representing more than 5% of a stock's outstanding shares, other than holdings by "block owners," were removed from the float for purposes of calculating the SPX Index. Generally, these "control holders" will include officers and directors, private equity, venture capital and special equity firms, other publicly traded companies that hold shares for control, strategic partners, holders of restricted shares, ESOPs, employee and family trusts, foundations associated with the company, holders of unlisted share classes of stock, government entities at all levels (other than government retirement/pension funds) and any individual person who controls a 5% or greater stake in a company as reported in regulatory filings. However, holdings by block owners, such as depository banks, pension funds, mutual funds and ETF providers, 401(k) plans of the company, government retirement/pension funds, investment funds of insurance companies, asset managers and investment funds, independent foundations and savings and investment plans, will ordinarily be considered part of the float.

Treasury stock, stock options, equity participation units, warrants, preferred stock, convertible stock, and rights are not part of the float. Shares held in a trust to allow investors in countries outside the country of domicile, such as depository shares and Canadian exchangeable shares are normally part of the float unless those shares form a control block.

For each stock, an investable weight factor ("IWF") is calculated by dividing the available float shares by the total shares outstanding. Available float shares are defined as the total shares outstanding less shares held by control holders. This calculation is subject to a 5% minimum threshold for control blocks. For example, if a company's officers and directors hold 3% of the company's shares, and no other control group holds 5% of the company's shares, S&P would assign that company an IWF of 1.00, as no control group meets the 5% threshold. However, if a company's officers and directors hold 3% of the company's shares and another control group holds 20% of the company's shares, S&P would assign an IWF of 0.77, reflecting the fact that 23% of the company's outstanding shares are considered to be held for control. As of July 31, 2017, companies with multiple share class lines are no longer eligible for inclusion in the SPX Index. Constituents of the SPX Index prior to July 31, 2017 with multiple share class lines will be grandfathered in and continue to be included in the SPX Index. If a constituent company of the SPX Index reorganizes into a multiple share class line structure, that company will remain in the SPX Index at the discretion of the S&P Index Committee in order to minimize turnover.

The SPX Index is calculated using a base-weighted aggregate methodology. The level of the SPX Index reflects the total market value of all 500 component stocks relative to the base period of the years 1941 through 1943. An indexed number is used to represent the results of this calculation in order to make the level easier to use and track over time. The actual total market value of the component stocks during the base period of the years 1941 through 1943 has been set to an indexed level of 10. This is often indicated by the notation 1941-43 = 10. In practice, the daily calculation of the SPX Index is computed by dividing the total market value of the component stocks by the "index divisor." By itself, the index divisor is an arbitrary number. However, in the context of the calculation of the SPX Index, it serves as a link to the original base period level of the SPX Index. The index divisor keeps the SPX Index comparable over time and is the manipulation point for all adjustments to the SPX Index, which is index maintenance.

Index Maintenance

Index maintenance includes monitoring and completing the adjustments for company additions and deletions, share changes, stock splits, stock dividends, and stock price adjustments due to company restructuring or spinoffs. Some corporate actions, such as stock splits and stock dividends, require changes in the common shares outstanding and the stock prices of the companies in the SPX Index, and do not require index divisor adjustments.

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To prevent the level of the SPX Index from changing due to corporate actions, corporate actions which affect the total market value of the SPX Index require an index divisor adjustment. By adjusting the index divisor for the change in market value, the level of the SPX Index remains constant and does not reflect the corporate actions of individual companies in the SPX Index. Index divisor adjustments are made after the close of trading and after the calculation of the SPX Index closing level.

Changes in a company's total shares outstanding of 5% or more due to public offerings are made as soon as reasonably possible. Other changes of 5% or more (for example, due to tender offers, Dutch auctions, voluntary exchange offers, company stock repurchases, private placements, acquisitions of private companies or non-index companies that do not trade on a major exchange, redemptions, exercise of options, warrants, conversion of preferred stock, notes, debt, equity participations, at-the-market stock offerings or other recapitalizations) are made weekly, and are generally announced on Fridays for implementation after the close of trading the following Friday (one week later). If a 5% or more share change causes a company's IWF to change by five percentage points or more, the IWF is updated at the same time as the share change. IWF changes resulting from partial tender offers are considered on a case-by-case basis.

#### Historical Information

The graph below sets forth information relating to the historical performance of the Reference Asset. In addition, below the graph is a table setting forth the intra-day high, intra-day low and period-end closing prices of the Reference Asset. The information provided in this table is for the four calendar quarters from 2008 to 2017, the first three calendar quarters of 2018 and for the period from October 1, 2018 through October 29, 2018.

We obtained the information regarding the historical performance of the Reference Asset in the chart below from Bloomberg Financial Markets.

We have not independently verified the accuracy or completeness of the information obtained from Bloomberg Financial Markets. The historical performance of the Reference Asset should not be taken as an indication of its future performance, and no assurance can be given as to the Final Level of the Reference Asset. We cannot give you assurance that the performance of the Reference Asset will result in any positive return on your investment.

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Period-Start Date	Period-End Date	High Intra-Day Price of the Reference Asset (\$)	Low Intra-Day Price of the Reference Asset (\$)	Period-End Closing Price of the Reference Asset (\$)
1/1/2008	3/31/2008	146.99	126.00	131.89
4/1/2008	6/30/2008	144.30	127.04	128.04
7/1/2008	9/30/2008	131.50	110.97	116.54
10/1/2008	12/31/2008	116.69	74.35	90.33
1/1/2009	3/31/2009	94.45	67.10	79.44
4/1/2009	6/30/2009	96.11	78.33	91.92
7/1/2009	9/30/2009	108.06	87.01	105.56
10/1/2009	12/31/2009	113.03	101.99	111.44
1/1/2010	3/31/2010	118.10	104.58	116.99
4/1/2010	6/30/2010	122.12	102.88	103.22
7/1/2010	9/30/2010	115.79	101.13	114.12
10/1/2010	12/31/2010	126.20	106.46	125.78
1/1/2011	3/31/2011	134.69	125.28	132.51
4/1/2011	6/30/2011	137.17	126.19	131.97
7/1/2011	9/30/2011	135.70	110.27	113.17
10/1/2011	12/31/2011	129.41	107.43	125.50
1/1/2012	3/31/2012	141.83	126.43	140.72
4/1/2012	6/30/2012	142.21	127.14	136.27
7/1/2012	9/30/2012	148.11	132.60	143.93
10/1/2012	12/31/2012	147.15	134.70	142.52
1/1/2013	3/31/2013	156.85	144.74	156.55
4/1/2013	6/30/2013	169.06	153.55	160.01
7/1/2013	9/30/2013	173.60	160.22	168.10
10/1/2013	12/31/2013	184.67	164.53	184.67
1/1/2014	3/31/2014	188.96	173.72	187.04
4/1/2014	6/30/2014	196.60	181.31	195.72
7/1/2014	9/30/2014	201.85	190.55	197.02
10/1/2014	12/31/2014	212.97	181.92	205.50
1/1/2015	3/31/2015	212.24	197.86	206.43
4/1/2015	6/30/2015	213.77	204.51	205.85
7/1/2015	9/30/2015	213.18	182.95	191.63
10/1/2015	12/31/2015	211.66	189.12	203.89
1/1/2016	3/31/2016	206.87	181.02	205.56
4/1/2016	6/30/2016	212.52	198.66	209.53
7/1/2016	9/30/2016	219.60	207.06	216.30
10/1/2016	12/31/2016	228.34	208.39	223.53
1/1/2017	3/31/2017	240.32	223.89	235.74
4/1/2017	6/30/2017	245.01	232.51	241.80
7/1/2017	9/30/2017	251.31	240.35	251.23
10/1/2017	12/31/2017	268.60	251.40	266.86
1/1/2018	3/31/2018	286.58	252.92	263.15
4/1/2018	6/30/2018	279.48	254.68	271.28

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7/1/2018	9/28/2018	293.93	269.25	290.72
10/1/2018	10/29/2018	293.21	259.86	263.86

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

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#### SUPPLEMENTAL PLAN OF DISTRIBUTION (CONFLICTS OF INTEREST)

Pursuant to the terms of a distribution agreement, RBCCM will purchase the Notes from us for distribution to CGMI. RBCCM will act as agent for the securities and will receive a fee of \$22.50 per \$1,000 in principal amount and will pay the entire fee to CGMI as a sales commission for each of the securities that CGMI sells. The actual underwriting fee will be equal to \$22.50 for each Note sold by CGMI directly to the public and will otherwise be equal to the selling concession provided to selected dealers, as described in this paragraph. CGMI will pay selected dealers that are not affiliated with CGMI a variable selling concession of up to \$22.50 for each \$1,000 in principal amount that they sell. Broker-dealers affiliated with CGMI, including Citi International Financial Services, Citigroup Global Markets Singapore Pte. Ltd. and Citigroup Global Markets Asia Limited, will receive a fixed selling concession, and financial advisers employed by such affiliated broker-dealers will receive a fixed sales commission, of \$22.50 for each \$1,000 in principal amount of the Notes that they sell.

CGMI paid registered representatives of CGMI a fixed sales commission of \$22.50 for each security they sold directly to the public.

Delivery of the Notes will be made against payment for the Notes on November 1, 2018, which is the third (3<sup>rd</sup>) business day following the Pricing Date (this settlement cycle being referred to as “T+3”). Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, purchasers who wish to trade the Notes more than two business days prior to the original Issue Date will be required to specify alternative settlement arrangements to prevent a failed settlement.

For additional information as to the relationship between us and RBCCM, please see the section “Plan of Distribution—Conflicts of Interest” in the prospectus dated September 7, 2018.

The value of the Notes shown on your account statement may be based on RBCCM’s estimate of the value of the Notes if RBCCM or another of our affiliates were to make a market in the Notes (which it is not obligated to do). That estimate will be based upon the price that RBCCM may pay for the Notes in light of then prevailing market conditions, our creditworthiness and transaction costs. For a period of approximately six months after the issue date of the Notes, the value of the Notes that may be shown on your account statement may be higher than RBCCM’s estimated value of the Notes at that time. This is because the estimated value of the Notes will not include the underwriting discount and our hedging costs and profits; however, the value of the Notes shown on your account statement during that period may be a higher amount, reflecting the addition of RBCCM’s underwriting discount and our estimated costs and profits from hedging the Notes. This excess is expected to decrease over time until the end of this period. After this period, if RBCCM repurchases your Notes, it expects to do so at prices that reflect their estimated value.

We may use this pricing supplement in the initial sale of the Notes. In addition, RBCCM or another of our affiliates may use this pricing supplement in a market-making transaction in the Notes after their initial sale. Unless we or our agent informs the purchaser otherwise in the confirmation of sale, this pricing supplement is being used in a market-making transaction.

#### STRUCTURING THE NOTES

The Notes are our debt securities, the return on which is linked to the performance of the Reference Asset. As is the case for all of our debt securities, including our structured notes, the economic terms of the Notes reflect our actual or perceived creditworthiness at the time of pricing. In addition, because structured notes result in increased operational, funding and liability management costs to us, we typically borrow the funds under these Notes at a rate that is more favorable to us than the rate that we might pay for a conventional fixed or floating rate debt security of comparable maturity. Using this relatively lower implied borrowing rate rather than the secondary market rate, is a factor that reduced the initial estimated value of the Notes at the time their terms were set. Unlike the estimated value included in

this pricing supplement, any value of the Notes determined for purposes of a secondary market transaction may be based on a different funding rate, which may result in a lower value for the Notes than if our initial internal funding rate were used.

In order to satisfy our payment obligations under the Notes, we may choose to enter into certain hedging arrangements (which may include call options, put options or other derivatives) on the issue date with RBCCM or one of our other subsidiaries. The

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terms of these hedging arrangements take into account a number of factors, including our creditworthiness, interest rate movements, the volatility of the Reference Asset, and the tenor of the Notes. The economic terms of the Notes and their initial estimated value depend in part on the terms of these hedging arrangements.

The lower implied borrowing rate is a factor that reduced the economic terms of the Notes to you. The initial offering price of the Notes also reflects the underwriting commission and our estimated hedging costs. These factors resulted in the initial estimated value for the Notes on the Pricing Date being less than their public offering price. See “Selected Risk Considerations—The Initial Estimated Value of the Notes Is Less than the Price to the Public” above.

#### SUPPLEMENTAL DISCUSSION OF U.S. FEDERAL INCOME TAX CONSEQUENCES

The following disclosure supplements, and to the extent inconsistent supersedes, the discussion in the product prospectus supplement dated September 11, 2018 under “Supplemental Discussion of U.S. Federal Income Tax Consequences.”

If the Notes are settled by physical delivery of a number of shares of the Reference Asset at maturity, although no assurances can be provided in this regard, a U.S. holder may generally expect not to recognize gain or loss upon maturity. However, a U.S. holder would generally be required to recognize loss, with respect to any cash received in lieu of a fractional share, equal to the difference between the cash received and the pro rata portion of the tax basis allocable to a fractional share. Any such loss would be treated as capital loss. A U.S. holder’s tax basis in the shares of Reference Asset delivered would generally equal its tax basis in the Notes, other than any amount allocable to a fractional share. A U.S. holder’s holding period for the shares of the Reference Asset delivered would begin on the day after the shares of the Reference Asset are received.

Under Section 871(m) of the Code, a “dividend equivalent” payment is treated as a dividend from sources within the United States. Such payments generally would be subject to a 30% U.S. withholding tax if paid to a non-U.S. holder. Under U.S. Treasury Department regulations, payments (including deemed payments) with respect to equity-linked instruments (“ELIs”) that are “specified ELIs” may be treated as dividend equivalents if such specified ELIs reference an interest in an “underlying security,” which is generally any interest in an entity taxable as a corporation for U.S. federal income tax purposes if a payment with respect to such interest could give rise to a U.S. source dividend. However, the IRS has issued guidance that states that the U.S. Treasury Department and the IRS intend to amend the effective dates of the U.S. Treasury Department regulations to provide that withholding on dividend equivalent payments will not apply to specified ELIs that are not delta-one instruments and that are issued before January 1, 2021. Based on our determination that the Notes are not delta-one instruments, non-U.S. holders should not be subject to withholding on dividend equivalent payments, if any, under the Notes. However, it is possible that the Notes could be treated as deemed reissued for U.S. federal income tax purposes upon the occurrence of certain events affecting the Reference Asset or the Notes, and following such occurrence the Notes could be treated as subject to withholding on dividend equivalent payments. Non-U.S. holders that enter, or have entered, into other transactions in respect of the Reference Asset or the Notes should consult their tax advisors as to the application of the dividend equivalent withholding tax in the context of the Notes and their other transactions. If any payments are treated as dividend equivalents subject to withholding, we (or the applicable withholding agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld.

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#### VALIDITY OF THE NOTES

In the opinion of Norton Rose Fulbright Canada LLP, the issue and sale of the Notes has been duly authorized by all necessary corporate action of the Bank in conformity with the Indenture, and when the Notes have been duly executed, authenticated and issued in accordance with the Indenture and delivered against payment therefor, the Notes will be validly issued and, to the extent validity of the Notes is a matter governed by the laws of the Province of Ontario or Québec, or the laws of Canada applicable therein, and will be valid obligations of the Bank, subject to equitable remedies which may only be granted at the discretion of a court of competent authority, subject to applicable bankruptcy, to rights to indemnity and contribution under the Notes or the Indenture which may be limited by applicable law; to insolvency and other laws of general application affecting creditors' rights, to limitations under applicable limitations statutes, and to limitations as to the currency in which judgments in Canada may be rendered, as prescribed by the Currency Act (Canada). This opinion is given as of the date hereof and is limited to the laws of the Provinces of Ontario and Québec and the federal laws of Canada applicable thereto. In addition, this opinion is subject to customary assumptions about the Trustee's authorization, execution and delivery of the Indenture and the genuineness of signatures and certain factual matters, all as stated in the letter of such counsel dated September 7, 2018, which has been filed as Exhibit 5.1 to Royal Bank's Form 6-K filed with the SEC dated September 7, 2018. In the opinion of Morrison & Foerster LLP, when the Notes have been duly completed in accordance with the Indenture and issued and sold as contemplated by the prospectus supplement and the prospectus, the Notes will be valid, binding and enforceable obligations of Royal Bank, entitled to the benefits of the Indenture, subject to applicable bankruptcy, insolvency and similar laws affecting creditors' rights generally, concepts of reasonableness and equitable principles of general applicability (including, without limitation, concepts of good faith, fair dealing and the lack of bad faith). This opinion is given as of the date hereof and is limited to the laws of the State of New York. This opinion is subject to customary assumptions about the Trustee's authorization, execution and delivery of the Indenture and the genuineness of signatures and to such counsel's reliance on the Bank and other sources as to certain factual matters, all as stated in the legal opinion dated September 7, 2018, which has been filed as Exhibit 5.2 to the Bank's Form 6-K dated September 7, 2018.

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