

Spectrum Technology Platform

Version 10.0

Geocoding Guide for Canada - SOAP

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GeocodeAddressGlobal

GeocodeAddressGlobal provides street-level geocoding for many countries. It can also determine city or locality centroids, as well as postal code centroids. GeocodeAddressGlobal handles street addresses in the native language and format. For example, a typical French formatted address might have a street name of Rue des Remparts. A typical German formatted address could have a street name Bahnhofstrasse.

Note: GeocodeAddressGlobal does not support U.S. or U.K. addresses. To geocode U.S. addresses, use GeocodeUSAddress. To geocode U.K. addresses, use GeocodeAddressGBR.

The countries available to you depends on which country databases you have installed. For example, if you have databases for Canada, Italy, and Australia installed, GeocodeAddressGlobal would be able to geocode addresses in these countries in a single stage. Before you can work with GeocodeAddressGlobal, you must define a global database resource containing a database for one or more countries. Once you create the database resource, a GeocodeAddressGlobal will become available in the Management Console, Enterprise Designer, and Interactive Driver.

GeocodeAddressGlobal is an optional component of the Enterprise Geocoding Module.

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Input	4
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Input

GeocodeAddressGlobal takes an address or intersection as input. To obtain the best performance and the most possible matches, your input address lists should be as complete as possible, free of misspellings and incomplete addresses, and as close to postal authority standards as possible. Most postal authorities have websites that contain information about address standards for their particular country.

Input Fields

To obtain the best performance and the most possible matches, your input address lists should be as complete as possible, free of misspellings and incomplete addresses, and as close to postal authority standards as possible. Most postal authorities have websites that contain information about address standards for their particular country.

NAVTEQ data is available for Canada. For NAVTEQ data, note the following:

Data © 1987 - 2015 HERE. All rights reserved.

The following table lists the input fields used for geocoding locations in Canada.

Table 1: Input Fields for Canada

Parameter	Description
AddressLine1	One of the following: - The address line containing the street name and building number. For example: 330 Main St Toronto ON M1B 3V4 - This field can also contain the full address. For more information, see Single Line Input on page 7 - For all countries except Argentina, Great Britain, and Japan, this field can contain a street intersection. To specify a street intersection, use double ampersand (&&) to separate the streets. For more information, see Street Intersection Input on page 8.
AddressLine2	The second address line of a two-line address. For example:

Parameter	Description
	26 WELLINGTON ST E SUITE 500 TORONTO ON M5E 1S2
City	The city or town name. Your input address should use the official city name.
County	The meaning of county varies by country. • CAN (Canada)—Not used
FirmName	Company or place name. For example: Toronto Star Building 1 Yonge St Toronto ON M5E 1E5
HouseNumber	The building number. You may get better parsing results for some countries if you put the house number in this field instead of AddressLine1. Not every country includes house number data. Note: The house number specified in the HouseNumber field takes precedence over any house number specified in the AddressLine1 field.
LastLine	The last line of the address. • 330 Main St Toronto ON M1B 3V4
Locality	The meaning of locality varies by country: • CAN (Canada)—Dissemination Area and Enumeration Area (DA and EA)
PostalCode	The postal code in the appropriate format for the country. Canada uses a six-character postal code. The first three characters are typically separated from the second three with a space. The first three characters are the FSA, the second three are the LDU. Street address geocoding only requires the FSA while postal code geocoding requires the full postal code (FSALDU). Choose whether you wish to have a space between the first three and last three characters of the postal code. Keeping this consistent speeds up the geocoding process.
StateProvince	The meaning of State/Province varies by country.

Parameter	Description
	• CAN (Canada)—Province

Address Input Guidelines

Follow these suggestions to ensure that your street input data is in the best format possible for optimal geocoding.

Address Guidelines for Canada

Follow these suggestions to ensure that your street input data is in the best format possible for optimum geocoding.

- **Post Office Box numbers**—P.O. Boxes and Rural Route addresses are not geocodable. GeocodeAddressCAN will honor this user input and attempt to output Boxes and Rural Route information, but it will not be used for geocoding purposes.
- **Highway addresses**—Highway addresses (such as Hwy 401) are geocoded.
- **House numbers and apartment letters**—Remove spaces between house number and apartment letter. 123 A Main Street does not geocode correctly because the geocoder assumes that the name of the street is A. Two workaround options are available:
 - Do not include the apartment letter.
 - Delete the space between house number and apartment letter: 123A Main Street geocodes because the geocoder ignores the A.
- **House numbers and unit information**—The house number pinpoints the location of the address. Unit input can be in one of two formats, as shown in the following examples:
 - 99-123 Main St, where 99 is the unit number. In this format, do not specify the unit type. The number 99 could be a suite, apartment, unit, floor or any valid unit type.
 - 123 Main St. Apt 99, where Apt is the unit type and 99 is the unit number. In this format, you must specify a valid unit type (such as Apt or Suite), otherwise the address will not be geocoded correctly.
- **Directional suffixes**—Use directional suffixes wherever possible. This is especially true in towns and cities, such as Calgary, which consist mainly of numbered streets. These streets can only be distinguished by their directional suffixes and street types. They also distinguish addresses on streets that change direction. For example: 123 Main St W and 123 Main St E have very different coordinates.
- **Street types**—These distinguish different streets of the same name. For example, Main Avenue and Main Street are two entirely different entities. Using types is not essential, but it adds precision to your data. For a list of valid street types see www.canadapost.com.
- **City name**—Do not abbreviate city names. If the city is unknown, you may leave it blank, although this may affect the accuracy of the geocode.
- **Province name**—You may use the full province name (for example, Ontario), but using the two-character abbreviation (ON) is recommended to reduce the likelihood of input errors.

Single Line Input

Instead of entering each address element in separate fields, you may enter the entire address in the AddressLine1 input field.

For all countries except Japan, you can enter addresses in one or more of these single-line formats.

Note: Not all formats may work for every country.

```
StreetAddress;PostalCode;City
StreetAddress;City;PostalCode
StreetAddress;City
StreetAddress;City;StateProvince;PostalCode
StreetAddress;Locality
StreetAddress;County;City
PostalCode;StreetAddress
PostalCode;StreetAddress;City
City;PostalCode;StreetAddress
```

Where:

- *StreetAddress* can be house number and street name in either order (with street type immediately before or after the street name).
- *City* is the city or town.
- *StateProvince* is the postal abbreviation for the state or province.
- *PostalCode* is the complete postcode. For Brazil,

Note: Not all of these address elements are used in every country.

Other single-line formats may also be acceptable for many countries.

The matching accuracy for single line input is comparable to that of structured address input. The performance of single line input addresses may be slightly slower than that of structured address input.

For best results, use delimiters (comma, semicolon, or colon) between each address element. For example,

```
26 Wellington Street East;Toronto;ON;M5E 1S2
```

If the input address is missing delimiters, spaces are recognized as separators and internal parsing rules identify address elements. In the example above, the address would still successfully geocode even if some or all of the delimiters were missing in the input.

Note: Non-delimited or partially-delimited single line addresses may take longer to geocode and may not produce the same results as delimited single line input. This is especially true for addresses with multi-word street names or cities. To optimize single line geocoding, use delimiters between address elements (particularly between street name and city).

Punctuation is ignored for geocoding purposes.

Guidelines for Single Line Input

- For Canada, if you omit the postal code and country, the geocoder still geocodes the address based on street address, city, and province.
- Punctuation is generally ignored, however you may improve results and performance by using separators (commas, semicolons, etc.) between different address elements.
- The country is not required. Each country geocoder assumes that the address is in its country.
- Firm information (placename, building name, or government building) is returned if available.

Street Intersection Input

If you enter a street intersection as input, the geocoder will provide the coordinates of the intersection.

To enter an intersection, specify the two street names separated by a double ampersand (&&) in AddressLine1. For some countries, the word AND can also be used to delimit intersections. The && delimiter can be used for all countries. For example:

AddressLine1: Yonge && Wellington
City: Toronto

Note: The double ampersand (&&) can always be used as a street intersection separator. For some countries, you can use additional symbols or words to delimit street intersections.

All close match criteria are enforced for intersection geocoding, just as for any street level geocoding.

Options

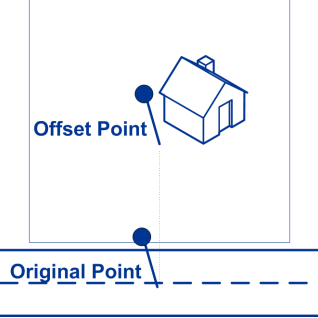
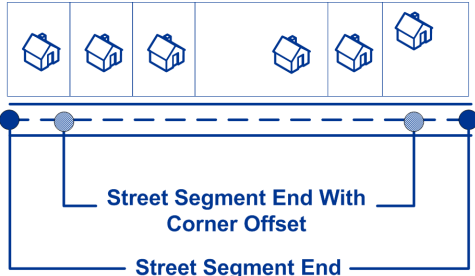
Geocoding Options

The following table lists the options that control how a location's coordinates are determined.

Table 2: Geocoding Options for Canada

Parameter	Description
GeocodeLevel	Specifies how precisely you want to geocode addresses. One of the following: StreetAddress The geocoder attempts to geocode addresses to a street address, but some matches may end up at a less precise location such as a postal code centroid, intersection, or shape path. PostalCentroid If postal code data is available, the geocoder attempts to geocode addresses to the most precise postal code it finds. The advantage of postal code centroid matching is the speed of the operation. The disadvantage of postal code matching is that the geocoder only examines the PostalCode field. If you use street address precision, the geocoder looks at both the street name and the PostalCode field and attempts to return street-level coordinates and optionally fall back to postal code coordinates. GeographicCentroid The geocoder attempts to geocode addresses to the geographic centroid of a city or state.
Interpolation	Specifies whether to perform address point interpolation. This option only works if you have a point database, installed. This option is available for selected countries only. Address point interpolation uses point data to refine geocode results. By default, the geocoding process estimates the location of an address based on the street numbers at either end of street segment. For example, if a street segment runs from 100 Main St. to 200 Main St., then a request for 150 Main St. will return a location in the middle of the segment. With interpolation, the geocoder finds the position of 180 Main St. in the point data, and it is about two-thirds of the way down the street. Using this information, the geocoder can estimate the position of 150 Main St. based on 100 and 180 Main St. In this case, the geocoder estimates the location of the address slightly away from the center of the segment. Y Yes, perform address point interpolation. N No, do not perform address point interpolation.

Parameter	Description
FallbackToGeographic	Specifies whether to attempt to determine a geographic region centroid when an address-level geocode cannot be determined. Y Yes, determine a geographic centroid when an address-level centroid cannot be determined. Default. N No, do not determine a geographic centroid when an address-level centroid cannot be determined.
FallbackToPostal	Specifies whether to attempt to determine a postal code centroid when an address-level geocode cannot be determined. Y Yes, determine a postal code centroid when an address-level centroid cannot be determined. Default. N No, do not determine a postal code centroid when an address-level centroid cannot be determined.
OffsetFromStreet	Indicates the offset distance from the street segments to use in street-level geocoding. The distance is specified in the units you specify in the OffsetUnits option. The default value varies by country. For most countries, the default is 7 meters. The offset distance is used in street-level geocoding to prevent the geocode from being in the middle of a street. It compensates for the fact that street-level geocoding returns a latitude and longitude point in the center of the street where the address is located. Since the building represented by an address is not on the street itself, you do not want the geocode for an address to be a point on the street. Instead, you want the geocode to represent the location of the building which sits next to the street. For example, an offset of 50 feet means that the geocode will represent a point 50 feet back from the center of the street. The distance is calculated perpendicular to the portion of the street segment for the address. Offset is also used to prevent addresses across the street from each other from being given the same point. The following diagram shows an offset point in relation to the original point.

Parameter	Description
OffsetFromCorner	 Street coordinates are accurate to 1/10,000 of a degree and interpolated points are accurate to the millionths of a degree. Specifies the distance to offset the street end points in street-level matching. The distance is specified in the units you specify in the OffsetUnits option. This value is used to prevent addresses at street corners from being given the same geocode as the intersection. Note: Offset is not supported for the United Kingdom (GBR) or Japan (JPN). The default value varies by country: • 12 meters—Australia (AUS), Austria (AUT), Germany (DEU) • 7 meters—For other supported countries, the default offset is 7 meters. The following diagram compares the end points of a street to offset end points. 
OffsetUnits	Specifies the unit of measurement for the street offset and corner offset options. One of the following: • Feet • Miles • Meters • Kilometers

Parameter	Description
CoordinateSystem	The default is Meters. A coordinate system is a reference system for the unique location of a point in space. Cartesian (planar) and Geodetic (geographical) coordinates are examples of reference systems based on Euclidean geometry. Spectrum™ Technology Platform supports systems recognized by the European Petroleum Survey Group (EPSG). Each country supports different coordinate systems. Depending on the country, you have one or more of the following options: EPSG:4326 Also known as the WGS84 coordinate system. EPSG:27200 Also known as the NZGD49 coordinate system.
IncludeInputs	Specifies whether to return the formatted input street address and each input address element in a separate field. This feature can help you understand how the input address was parsed and identify specific input elements that could not be geocoded. For example, a returned HouseNumber.Input could contain an invalid house number in your input address. Note: Data vintage must be 2014 Q4 or newer to get Parsed Address Input returns. Also note that Parsed Address Input elements are not returned for every country. Parsed Address Input elements are returned in separately labeled fields names with a .Input extension. For example: • FormattedInputStreet.Input • City.Input • Country.Input • HouseNumber.Input • Locality.Input • PostalCode.Base.Input • StreetName.Input • StreetSuffix.Input Other labeled fields are possible depending on the input address, country, and data source. Note: Parsed Address Input elements are not returned for every country. Also, because Geocode Address World geocodes to the geographic or postal level only (not street address), this does not return Parsed Address Input

Parameter	Description
	For many countries, if part of the input address could not be recognized as a specific address element, this content is returned in <code>UnparsedWords.Input</code>. For intersection addresses, the first entered street is returned in <code>StreetName.Input</code> and the second entered street name is returned in <code>IntersectionStreet2.Input</code>.

Matching Options

Matching options let you set match restrictions, fallback, and multiple match settings so that the matching can be as strict or relaxed as you need. The strictest matching conditions require an exact match on house number, street name, postal code and no fallback to postal code centroids. The geocoder looks for an exact street address match within the postal code in the input address. Relaxing the conditions broadens the area in which it searches for a match. For example, by relaxing the postal code, the geocoder searches for candidates outside the postal code but within the city of your input address.

Table 3: Matching Options for Canada

Parameter	Description
KeepMultimatch	Specifies whether to return results when the address matches to multiple candidates in the database. If this option is not selected, an address that results in multiple candidates will fail to geocode. If you select this option, specify the maximum number of candidates to return Y Yes, return candidates when multiple candidates are found. Default. N No, do not return candidates. Addresses that result in multiple candidates will fail to geocode.
MaxCandidates	If you specify <code>KeepMultimatch=Y</code>, this option specifies the maximum number of results to return. The default is 1. Specify -1 (minus one) to return all possible candidates.
ReturnRanges	Specifies whether to return address range information. If you enable this option, the output field <code>Ranges</code> will be included in the output. A range is a series of addresses along a street segment. For example, 5400-5499 Main St. is an address range representing addresses in

Parameter	Description
	the 5400 block of Main St. A range may represent just odd or even addresses within a segment, or both odd and even addresses. A range may also represent a single building with multiple units, such as an apartment building. Y Yes, return address range information. N No, do not return address range information. Default.
MaxRanges	If you choose to return ranges, this option specifies the maximum number of ranges to return for each candidate. Since the geocoder returns one candidate per segment, and since a segment may contain multiple ranges, this option allows you to see the other ranges in a candidate's segment.
MaxRangeUnits	If you choose to return ranges, this option specifies the maximum number of units (for example, apartments or suites) to return for each range. For example, if you were to geocode an office building at 65 Main St. containing four suites, there would be a maximum of four units returned for the building's range (65 Suite 1, 65 Suite 2, 65 Suite 3, and 65 Suite 4). If you were to specify a maximum number of units as 2, then only two units would be returned instead of all four.
CloseMatchesOnly	Specifies whether to return only those geocoded results that are close match candidates. For example, if there are 10 candidates and two of them are close candidates, and you enable this option, only the two close matching candidates would be returned instead of all 10. To specify what is considered a close match, use the options. Address candidates are ranked according to how closely the input address matches these preferences. Y Yes, return only close matches. N No, do not return only close matches. Default.
MatchMode	Specifies how to determine whether a candidate is a close match. One of the following: CustomMode This option allows you to specify which parts of a candidate address must match the input address to be considered a close match. Use the to specify the address elements you want. This is the default value for most countries. ExactMode All of a candidate address's elements must match in order for the candidate to be considered a close match.

Parameter	Description
	CloseMode Only the candidate address's house number must match in order for the candidate to be considered a close match. For Chile, China, Great Britain, Estonia, India, Indonesia, Latvia, Lithuania, Slovakia, Slovenia, Taiwan, and South Africa, only the street name and town must match. RelaxedMode All candidate addresses are considered a close match.
MustMatchInput	Specifies whether candidates must match all non-blank input fields to be considered a close match. For example, if an input address contains a city and postal code, then candidates for this address must match the city and postal code to be considered a close match. Y Yes, a candidate must match all input to be considered a close match. N No, a candidate does not have to match all input to be considered a close match. Default.
MustMatchHouseNumber	Specifies whether candidates must match the house number to be considered a close match. If you select this option you should also require an exact match on street name. This option does not significantly affect performance. It does, however, affect the type of match if the candidate address corresponds to a segment that does not contain any ranges. The type of match can also be affected when the house number range for a candidate does not contain the input house number. If you relax the house number, you should set the maximum ranges to be returned to a value higher than 0. Y Yes, a candidate must match the house number to be considered a close match. N No, a candidate does not have to match the house number to be considered a close match.
MustMatchStreet	Specifies whether candidates must match the street name to be considered a close match. If a close match is found, the geocoder attempts expanded street name manipulation, which looks for candidates with names that sound like the input address or that are spelled improperly. This slows down performance but increases the match rate. If the geocoding database is indexed, the performance impact is reduced.

Parameter	Description
MustMatchLocality	Y Yes, a candidate must match the street name to be considered a close match. N No, a candidate does not have to match the street name to be considered a close match.
	If you do not require exact matches on locality, the geocoder searches on the street address matched to the particular postal code, and considers other localities that do not match the name, but do match the postal code. CAN (Canada)—Dissemination Area and Enumeration Area (DA and EA)
	Y Yes, a candidate must match the locality to be considered a close match. N No, a candidate does not have to match the locality to be considered a close match.
MustMatchCity	Specifies whether candidates must match the city to be considered a close match. For Japan, this field specifies whether the candidate must match the municipality subdivision (oaza). If you do not require exact matches on city, the geocoder searches on the street address matched to the particular postal code, and considers other cities that do not match the name, but do match the postal code.
	Y Yes, a candidate must match the city to be considered a close match. N No, a candidate does not have to match the city to be considered a close match.
MustMatchCounty	Specifies whether candidates must match the county (or equivalent) to be considered a close match. The meaning of county varies for different countries. CAN (Canada)—Not used One of the following:
	Y Yes, a candidate must match the county to be considered a close match. N No, a candidate does not have to match the county to be considered a close match.
MustMatchStateProvince	Specifies whether candidates must match the state or province (or equivalent) to be considered a close match. CAN (Canada)—Province

Parameter	Description
	One of the following: Y Yes, a candidate must match the state or province to be considered a close match. N No, a candidate does not have to match the state or province to be considered a close match.
MustMatchPostalCode	Specifies whether candidates must match the postal code to be considered a close match. If you do not require exact match on postal codes, the geocoder searches a wider area for a match. While this results in slower performance, the match rate is higher because the request does not need to match exactly when it compares match candidates. Y Yes, a candidate must match the postal code to be considered a close match. N No, a candidate does not have to match the postal code to be considered a close match.
MustMatchFullPostalCode	This option applies only to Canadian addresses. Specifies whether a candidate address must have a full postal code (FSA and LDU) to be considered a close match. Canadian postal codes are divided into two sections: the Forward Sortation Area (FSA) and the Local Delivery Unit (LDU). For example, the postal code M6H 2P8 has an FSA of M6H and an LDU of 2P8. Some candidate addresses may contain only the FSA. This option allows you to prevent such addresses from being classified a close match. Y Yes, the candidate address must contain a full postal code to be considered a close match. N No, the candidate address does not have to contain a full postal code to be considered a close match. Default.
SortCandidatesUsingLocale	This is a Reverse geocoding option that applies to Greece, Russia, Ukraine, and any other country that supports dual character sets (such as the Middle East countries). Specifies whether candidates are sorted and returned based on the input language. That is, if the input was in Russian, the Russian character candidate is returned first followed by the English language candidate. This will override the dictionary order. Y Yes, candidates are sorted and returned based on input language.

Parameter	Description
N	No, candidates are returned in the order that the dictionary was added to the database, regardless of input language.

You may want to use a balanced strategy between match rate and geographic precision. That is, you may want to geocode as many records as possible automatically, but at the same time want to minimize the number of weaker matches (false positives). For example, false positives can occur when the geocoder:

- finds a street that sounds like the input street.
- finds the same street in another city (if postal code match is not required).
- finds the street but with a different house number (if house number is not required).

The following settings may achieve a good balance between match rate and precision:

- **CloseMatchesOnly**—Specify "Y".
- **MustMatchHouseNumber**—Specify "Y".
- **MustMatchStreet**—Specify "Y".
- **FallbackToPostal**—Specify "N".

Data Options

The Data tab allows you to specify which databases to use in geocoding. Databases contain the address and geocode data necessary to determine the geocode for a given address. There are two kinds of databases: standard databases and custom databases. Standard databases are those supplied by Pitney Bowes and based on address and geocoding data from postal authorities and suppliers of geographical data. Custom databases are databases you create to enhance or augment standard databases for your particular needs.

The following table lists the options available for specifying which databases to use and the search order of databases.

Table 4: Data Options for Canada

Parameter	Description
Database	Specifies the database to be used for geocoding. Only databases that have been defined in the Databases Resources panel in the Management Console are available.
DatabasePreference	Specifies which geocoding databases to use. One of the following: PreferCustom Use both standard databases and custom databases, but give preference to candidates from custom databases. Use this option if you feel your

Parameter	Description
	custom database is superior to the standard database. PreferStandard Use both standard databases and custom databases, but give preference to candidates from standard databases. CustomOnly Use only custom databases. Ignore standard databases. StandardOnly Use only standard databases. Ignore custom databases. Both Use both standard databases and custom databases. In cases where candidates are returned from both, the standard database is preferred. Default. The results from a custom database have a "U" at the end of the result code. Results from an address database have an "A" at the end of the match score. For example: S5HPNTSCZA is a match score that comes from an address database, while S5HPNTSCZU comes from a custom database. For more information, see Result Codes for International Geocoding on page 37.
DatabaseSearchOrder	The name of one or more database resources to use in the search process. Use the database name specified in the Management Console's Database Resources tool. You can specify multiple database resources. If you specify more than one database, list them in order of preference. The order of the databases has an effect when there are close match candidates from different databases. The close matches that are returned come from the database that is first in the search list. Close matches from lower ranked databases are demoted to non-close matches. You can also use the order of the databases to perform fallback processing if you have an both an address point database and a street-level database installed for the country. List the address point database first and the street database second. If the address cannot be geocoded to the address point level, the geocoder will attempt to geocode it to the street level.

Related Links

[GeocodeAddressGlobal](#) on page 3

Output Data Options

The following table lists the options that control which data is returned in the output.

Table 5: Output Data Options

Parameter	Description
ReturnOnlySimilarFirmNames	This option applies to the U.K. only. Specifies whether to return firm names only when the input firm name is similar to the firm name in the geocoding database. For example, if the input firm name is "Pitney Bowes" but the geocoding database returns "Pitney Bowes Software, Inc.", these two firm names are not similar. In most cases the input firm name must match the firm name in the database exactly. Some differences in abbreviations are considered similar enough to result in the firm name being returned. Y Yes, return only firm names that are similar to the input firm name. N No, return firm names regardless of whether they are close to the input firm name. Default.

Output

The geocoder returns the latitude/longitude, standardized address, and result indicators. Result indicators describe how well the geocoder matched the input address to a known address and assigned a location; they also describe the overall status of a match attempt. If you are using the API, the output returned is in the DataTable class. For information on the DataTable class, see the "API Fundamentals" section of the .

Address Output

The address may be identical to the input address if the input address was accurate, or it may be a standardized version of the input address, or it may be a candidate address when multiple matches are found.

Table 6: Address Output for Canada

Response Element	Description								
AddressLine1	First line of the address.								
AddressLine2	Second line of the address.								
ApartmentLabel	The type of unit, such as apartment, suite, or lot.								
ApartmentNumber	Unit number.								
City	The municipality name.								
Country	The three-letter ISO 3166-1 Alpha 3 country code. For Canada, the country code is CAN. Addresses for countries that do not have a dedicated geocoding stage return the country code associated with the input address. For example, Vatican City addresses return VAT in the Country field, regardless of whether VAT or ITA (Italy) was passed as the country code. Similarly, addresses in Martinique return MTQ (rather than FRA) in the Country field.								
County	The meaning of county varies by country. • CAN (Canada)—Not used								
FirmName	Name of the company or a place name.								
HouseNumber	The building number for the matched location.								
HouseNumberHigh	The highest house number of the range in which the address resides.								
HouseNumberLow	The lowest house number of the range in which the address resides.								
HouseNumberParity	Indicates if the house number range contains even or odd numbers or both. <table> <tr> <td>E</td><td>Even</td></tr> <tr> <td>O</td><td>Odd</td></tr> <tr> <td>B</td><td>Both</td></tr> <tr> <td>U</td><td>Unknown</td></tr> </table>	E	Even	O	Odd	B	Both	U	Unknown
E	Even								
O	Odd								
B	Both								
U	Unknown								
Language	For reverse geocoded candidates, the two-character language code is returned.								
LastLine	Complete last address line (city, state/province, and postal code).								

Response Element	Description						
LeadingDirectional	Street directional that precedes the street name. For example, the N in 138 N Main Street.						
Locality	The meaning of locality varies by country: • CAN (Canada)—Dissemination Area and Enumeration Area (DA and EA)						
NumberOfCandidateRanges	Indicates the number of ranges of which the candidate is a member. A candidate may be a part of multiple ranges if the candidate is a street instead of a building.						
NumberOfRangeUnits	Indicates the number of units included in the range. A unit is an address within a building, such as an apartment or office suite.						
PostalCode	The postcode for the address. The format of the postcode varies by country. Postcode data is not available for every country.						
PostalCode.Addon	The second part of a postcode. For Canadian addresses this will be the LDU. This field is not used by most countries.						
PreAddress	Miscellaneous information that appears before the street name.						
PrivateMailbox	This field is not currently used.						
Ranges	This is a list field containing the address ranges that exist on the street segment where the candidate address is located. A range is a series of addresses along a street segment. For example, 5400-5499 Main St. is an address range representing addresses in the 5400 block of Main St. A range may represent just odd or even addresses within a segment, or both odd and even addresses. A range may also represent a single building with multiple units, such as an apartment building. The Ranges field contains the following sub-fields: <table> <tr> <td>Address</td><td>This is a list field that contains sub-fields for any address elements (AddressLine1, City, and so on) that are different from the candidate's address.</td></tr> <tr> <td>AdditionalFields</td><td>A listing of country-specific information related to the address. The information contained in AdditionalFields varies by country.</td></tr> <tr> <td>HouseNumberHigh</td><td>The highest address number for the range.</td></tr> </table>	Address	This is a list field that contains sub-fields for any address elements (AddressLine1, City, and so on) that are different from the candidate's address.	AdditionalFields	A listing of country-specific information related to the address. The information contained in AdditionalFields varies by country.	HouseNumberHigh	The highest address number for the range.
Address	This is a list field that contains sub-fields for any address elements (AddressLine1, City, and so on) that are different from the candidate's address.						
AdditionalFields	A listing of country-specific information related to the address. The information contained in AdditionalFields varies by country.						
HouseNumberHigh	The highest address number for the range.						

Response Element	Description
HouseNumberLow	The lowest address number for the range.
SegmentParity	Indicates the side of the street where the range is located. One of the following: 0 It is not known which side of the street the range is located on. 1 The range is on the left side of the street. 2 The range is on the right side of the street.
HouseNumberParity	Indicates whether the range contains odd or even address numbers. One of the following: 0 The range contains both odd and even address numbers. 1 The range contains odd address numbers 2 The range contains even address numbers. -1 It is not known whether the range contains odd or even house numbers.
TotalRangeUnitsReturned	The number of unit ranges returned for the address. A unit is an address within a building, such as an apartment or suite.
RangeUnits	A list of the ranges of units within the building. An example of units are apartments or suites. Address This is a list filed that contains sub-fields for any address elements (AddressLine1, City, and so on) that are different from the candidate's address. UnitNumberHigh The highest unit number. UnitNumberLow The lowest unit number.

Response Element	Description
SegmentCode	A unique ID that identifies a street segment.
SegmentParity	Indicates which side of the street has odd numbers. L Left side of the street R Right side of the street B Both sides of the street U Undetermined
StateProvince	The meaning of State/Province varies by country. • CAN (Canada)—Province
StreetDataType	The default search order rank of the database used to geocode the address. A value of "1" indicates that the database is first in the default search order, "2" indicates that the database is second in the default search order, and so on. The default database search order is specified in the Management Console with the Database Resources tool.
StreetName	For most countries, this contains the street name.
StreetPrefix	The type of street when the street type appears before the base street name.
StreetSuffix	The type of street when the street type appears after the base street name.
TrailingDirectional	Street directional that follows the street name. For example, the N in 456 3rd St. N.
UnitNumberHigh	The highest unit number of the range in which the unit resides.
UnitNumberLow	The lowest unit number of the range in which the unit resides.
Return Parsed Address	The formatted input address can be returned along with a separate returned field for each input address element. Parsed Address Input elements are returned in separately labeled fields names with a .Input extension. See the Return Parsed Address Geocoding Option for more information.

Geocode Output

Table 7: Geocode Output for Canada

Response Element	Description
CoordinateSystem	The coordinate system used to determine the latitude and longitude coordinates. A coordinate system specifies a map projection, coordinate units, etc. An example is EPSG:4326. EPSG stands for European Petroleum Survey Group.
Latitude	Seven-digit number in degrees and calculated to four decimal places (in the format specified).
Longitude	Seven-digit number in degrees and calculated to four decimal places (in the format specified).

Result Codes

Result codes contain information about the success or failure of the geocoding attempt, as well as information about the accuracy of the geocode.

Table 8: Result Code Output for Canada

Response Element	Description
Geocoder.MatchCode	Indicates how closely the input address matches the candidate address. For more information, see Result Codes for International Geocoding on page 37.
IsCloseMatch	Indicates whether or not the address is considered a close match. An address is considered close based on the "Close match criteria" options on the Matching tab. Y Yes, the address is a close match. N No, the address is not a close match.
MultiMatchCount	For street address geocoding, the number of matching address positions found for the specified address. For intersection geocoding, the number of matching street intersection positions found for the specified addresses.
Status	Reports the success or failure of the match attempt

Response Element	Description														
Status.Code	null Success														
	F Failure														
Status.Code	If the geocoder could not process the address, this field will show the reason. • Internal System Error • No Geocode Found • Insufficient Input Data • Multiple Matches Found • Exception occurred • Unable to initialize Geocoder • No Match Found														
Status.Description	If the geocoder could not process the address, this field will show a description of the failure. <table> <tr> <td>Problem + explanation</td><td>Returned when Status.Code = Internal System Error.</td></tr> <tr> <td>Geocoding Failed</td><td>Returned when Status.Code = No Geocode Found.</td></tr> <tr> <td>No location returned</td><td>Returned when Status.Code = No Geocode Found.</td></tr> <tr> <td>No Candidates Returned</td><td>The geocoder could not identify any candidate matches for the address.</td></tr> <tr> <td>Multiple Candidates Returned and Keep Multiple Matches not selected</td><td>The address resulted in multiple candidates. In order for the candidate address to be returned, you must.</td></tr> </table>	Problem + explanation	Returned when Status.Code = Internal System Error.	Geocoding Failed	Returned when Status.Code = No Geocode Found.	No location returned	Returned when Status.Code = No Geocode Found.	No Candidates Returned	The geocoder could not identify any candidate matches for the address.	Multiple Candidates Returned and Keep Multiple Matches not selected	The address resulted in multiple candidates. In order for the candidate address to be returned, you must.				
Problem + explanation	Returned when Status.Code = Internal System Error.														
Geocoding Failed	Returned when Status.Code = No Geocode Found.														
No location returned	Returned when Status.Code = No Geocode Found.														
No Candidates Returned	The geocoder could not identify any candidate matches for the address.														
Multiple Candidates Returned and Keep Multiple Matches not selected	The address resulted in multiple candidates. In order for the candidate address to be returned, you must.														
LocationPrecision	A code describing the precision of the geocode. One of the following: <table> <tr> <td>0</td><td>No coordinate information is available for this candidate address.</td></tr> <tr> <td>1</td><td>Interpolated street address.</td></tr> <tr> <td>2</td><td>Street segment midpoint.</td></tr> <tr> <td>3</td><td>Postal code 1 centroid.</td></tr> <tr> <td>4</td><td>Partial postal code 2 centroid.</td></tr> <tr> <td>5</td><td>Postal code 2 centroid.</td></tr> <tr> <td>6</td><td>Intersection.</td></tr> </table>	0	No coordinate information is available for this candidate address.	1	Interpolated street address.	2	Street segment midpoint.	3	Postal code 1 centroid.	4	Partial postal code 2 centroid.	5	Postal code 2 centroid.	6	Intersection.
0	No coordinate information is available for this candidate address.														
1	Interpolated street address.														
2	Street segment midpoint.														
3	Postal code 1 centroid.														
4	Partial postal code 2 centroid.														
5	Postal code 2 centroid.														
6	Intersection.														

Response Element	Description
	7 Point of interest. This is a placeholder value. Spectrum databases do not have POI data, so it is not possible to get this return. 8 State/province centroid. 9 County centroid. 10 City centroid. 11 Locality centroid. 12 - 15 (LocationPrecision codes) For most countries, LocationPrecision codes 12 through 15 are reserved for unspecified custom items. 13 Additional point precision for unspecified custom item. 14 Additional point precision for unspecified custom item. 15 Additional point precision for unspecified custom item. 16 The result is an address point. 17 The result was generated by using address point data to modify the candidates segment data. 18 The result is an address point that was projected using the centerline offset feature. You must have both a point and a street range database to use the centerline offset feature, and thereby return LocationPrecision 18.
StreetDataType	The default search order rank of the database used to geocode the address. A value of "1" indicates that the database is first in the default search order, "2" indicates that the database is second in the default search order, and so on. The default database search order is specified in the Management Console with the Database Resources tool.

Country-Specific Output

The following topics describe output that's unique to specific countries.

Canada-Specific Output

The following table lists output fields that are unique to Canada.

Table 9: Canada-Specific Output

Response Element	Description
CAN.Census_CD	The Census Division (CD) in which the address is located. For more information, see the Census Division definition available on the Statistics Canada website.
CAN.Census_CMA	The Census Metropolitan Area (CMA) in which the address is located. For more information, see the Census Metropolitan Area definition on the Statistics Canada website.
CAN.Census_CSD	The Census Subdivision (CSD) in which the address is located. For more information, see the Census Subdivision definition on the Statistics Canada website.
CAN.Census_CT	The Census Tract (CT) in which the address is located. For more information, see the Census Tract definition on the Statistics Canada website.
CAN.Census_DA	The Dissemination Area (DA) in which the address is located. For more information, see the Dissemination Area definition available on the Statistics Canada website.

2 -

ReverseGeocodeAddressGlobal

ReverseGeocodeAddressGlobal determines the address for a given latitude/longitude point. ReverseGeocodeAddressGlobal can determine addresses in many countries. The countries available to you depends on which country databases you have installed. For example, if you have databases for Canada, Italy, and Australia installed, ReverseGeocodeAddressGlobal would be able to geocode addresses in these countries in a single stage.

Note: ReverseGeocodeAddressGlobal does not support U.S. addresses. To geocode U.S. addresses, use ReverseGeocodeUSLocation.

Before you can work with ReverseGeocodeAddressGlobal, you must define a global database resource containing a database for one or more countries. Once you create the database resource, a ReverseGeocodeAddressGlobal will become available in the Management Console, Enterprise Designer, and Interactive Driver.

In this section

Input	30
Options	30
Output	34

Input

ReverseGeocodeAddressGlobal takes longitude and latitude as input.

Table 10: ReverseGeocodeGlobal Input

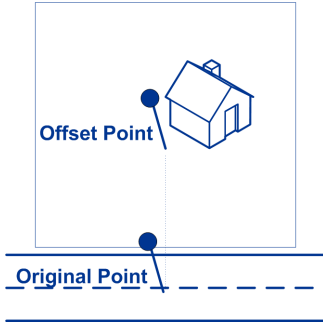
Parameter	Format	Description
Latitude	String	The latitude of the point for which you want address information.
Longitude	String	The longitude of the point for which you want address information.
Country	String	One of the following: • The name of the country in English. • The two-character ISO 3116-1 alpha-2 country code. • The three-character ISO 3116-1 alpha-3 country code.

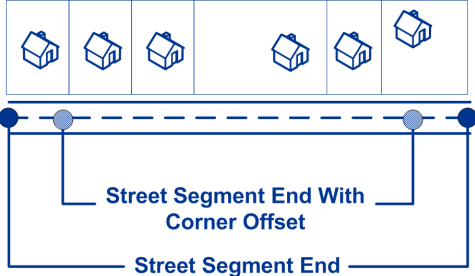
Options

Geocoding Options

Table 11: Geocoding Options for Canada

Parameter	Description
SearchDistance	The radius from the input coordinates in which to search for an address. Street segments and points within the radius are considered. The default search radius is 150 meters and the maximum search radius is 1600 meters.
Units	The units in which the search distance is specified. One of the following: • Feet

Parameter	Description
OffsetFromStreet	• Miles • Meters • Kilometers Indicates the offset distance from the street segments to use in street-level geocoding. The distance is specified in the units you specify in the OffsetUnits option. The default value varies by country. For most countries, the default is 7 meters. The offset distance is used in street-level geocoding to prevent the geocode from being in the middle of a street. It compensates for the fact that street-level geocoding returns a latitude and longitude point in the center of the street where the address is located. Since the building represented by an address is not on the street itself, you do not want the geocode for an address to be a point on the street. Instead, you want the geocode to represent the location of the building which sits next to the street. For example, an offset of 50 feet means that the geocode will represent a point 50 feet back from the center of the street. The distance is calculated perpendicular to the portion of the street segment for the address. Offset is also used to prevent addresses across the street from each other from being given the same point. The following diagram shows an offset point in relation to the original point.  Street coordinates are accurate to 1/10,000 of a degree and interpolated points are accurate to the millionths of a degree. Specifies the distance to offset the street end points in street-level matching. The distance is specified in the units you specify in the OffsetUnits option. This value is used to prevent addresses at street corners from being given the same geocode as the intersection. Note: Offset is not supported for the United Kingdom (GBR) or Japan (JPN).
OffsetFromCorner	

Parameter	Description
	The default value varies by country: • 12 meters—Australia (AUS), Austria (AUT), Germany (DEU) • 7 meters—For other supported countries, the default offset is 7 meters. The following diagram compares the end points of a street to offset end points. 
OffsetUnits	Specifies the unit of measurement for the street offset and corner offset options. One of the following: • Feet • Miles • Meters • Kilometers The default is Meters.
CoordinateSystem	A coordinate system is a reference system for the unique location of a point in space. Cartesian (planar) and Geodetic (geographical) coordinates are examples of reference systems based on Euclidean geometry. Spectrum™ Technology Platform supports systems recognized by the European Petroleum Survey Group (EPSG). Each country supports different coordinate systems. Depending on the country, you have one or more of the following options: EPSG:4326 Also known as the WGS84 coordinate system. EPSG:27200 Also known as the NZGD49 coordinate system.

Matching Options

Table 12: Matching Options for Canada

Parameter	Description
KeepMultimatch	Specifies whether to return results when the coordinates match to multiple candidate addresses in the database. If this option is not selected, coordinates that results in multiple address candidates will fail to geocode. If you select this option, specify the maximum number of candidates to return using the MaxCandidates option (see below). Y Yes, return candidates when multiple candidates are found. Default. N No, do not return candidates. Addresses that result in multiple candidates will fail to geocode.
SortCandidatesUsingLocale	This is a Reverse geocoding option that applies to Greece, Russia, Ukraine, and any other country that supports dual character sets (such as the Middle East countries). Specifies whether candidates are sorted and returned based on the input language. That is, if the input was in Russian, the Russian character candidate is returned first followed by the English language candidate. This will override the dictionary order. Y Yes, candidates are sorted and returned based on input language. N No, candidates are returned in the order that the dictionary was added to the database, regardless of input language.

Data Options

The Data tab allows you to specify which databases to use in reverse geocoding. Databases contain the address and geocode data necessary to determine the address for a given point. The following table lists the options available for specifying the search order of databases.

Table 13: Data Options for Canada

Parameter	Description
DatabaseSearchOrder	The name of one or more database resources to use in the search process. Use the database name specified in the Management Console's Database Resources tool. You can specify multiple database resources. If you specify more than one database, list them in order of preference. The order of the databases has an effect when there are close match candidates from different databases. The close matches that are returned come from the database that is first in the search list. Close matches from lower ranked databases are demoted to non-close matches. You can also use the order of the databases to perform fallback processing if you have an both an address point database and a street-level database installed for the country. List the address point database first and the street database second. If the address cannot be geocoded to the address point level, the geocoder will attempt to geocode it to the street level.

Output

Table 14: Reverse Geocode Address Global Output Fields

Response Element	Description
AddressLine1	First line of the address.
AddressLine2	Second line of the address.
ApartmentLabel	The type of unit, such as apartment, suite, or lot.
ApartmentNumber	Unit number.
City	The municipality name.
County	The meaning of county varies by country. CAN (Canada)—Not used

Response Element	Description
Distance	The distance from input location in meters. If the input coordinates are an exact match for the address, the value is 0.
FirmName	Name of the company or a place name.
Geocoder.MatchCode	Indicates how closely the input coordinates match the candidate address. For more information, see Reverse Geocoding Codes (R Codes) on page 41.
HouseNumber	The building number for the matched location.
HouseNumberHigh	The highest house number of the range in which the address resides.
HouseNumberLow	The lowest house number of the range in which the address resides.
HouseNumberParity	Indicates if the house number range contains even or odd numbers or both. E Even O Odd B Both U Unknown
Language	For reverse geocoded candidates, the two-character language code is returned.
LastLine	Complete last address line (city, state/province, and postal code).
LeadingDirectional	Street directional that precedes the street name. For example, the N in 138 N Main Street.
Locality	The meaning of locality varies by country: • CAN (Canada)—Dissemination Area and Enumeration Area (DA and EA)
NumberOfCandidateRanges	Indicates the number of ranges of which the candidate is a member. A candidate may be a part of multiple ranges if the candidate is a street instead of a building.
NumberOfRangeUnits	Indicates the number of units included in the range. A unit is an address within a building, such as an apartment or office suite.
PostalCode	The postcode for the address. The format of the postcode varies by country. Postcode data is not available for every country.

Response Element	Description
PostalCode.Addon	The second part of a postcode. For Canadian addresses this will be the LDU. This field is not used by most countries.
PreAddress	Miscellaneous information that appears before the street name.
PrivateMailbox	This field is not currently used.
SegmentCode	A unique ID that identifies a street segment.
SegmentParity	Indicates which side of the street has odd numbers. L Left side of the street R Right side of the street B Both sides of the street U Undetermined
StateProvince	The meaning of State/Province varies by country. • CAN (Canada)—Province
StreetDataType	The default search order rank of the database used to geocode the address. A value of "1" indicates that the database is first in the default search order, "2" indicates that the database is second in the default search order, and so on. The default database search order is specified in the Management Console with the Database Resources tool.
StreetName	For most countries, this contains the street name.
StreetPrefix	The type of street when the street type appears before the base street name.
StreetSuffix	The type of street when the street type appears after the base street name.
TrailingDirectional	Street directional that follows the street name. For example, the N in 456 3rd St. N.
UnitNumberHigh	The highest unit number of the range in which the unit resides.
UnitNumberLow	The lowest unit number of the range in which the unit resides.

3 - Result Codes for International Geocoding

Candidates returned by Spectrum geocoders return another class of return codes that are referred to as International Geocoding Result Codes. Each attempted match returns a result code in the Geocoder.MatchCode output field.

In this section

International Street Geocoding Result Codes (S Codes)	38
Interpreting S Result Codes	39
International Postal Geocoding Result Codes (Z Codes)	40
International Geographic Geocoding Result Codes (G Codes)	40
Reverse Geocoding Codes (R Codes)	41
Non-match Codes	41

International Street Geocoding Result Codes (S Codes)

Street level geocoded candidates return a result code beginning with the letter S. The second character in the code indicates the positional accuracy of the resulting point for the geocoded record.

Table 15: Street (S) Result Codes

S Result Code	Description
S1	Single close match with the point located at postal code centroid. For Canada, this is an FSA centroid.
S3	Single close match with the point located at postal code centroid. For Canada, this is an FSALDU centroid.
S4	Single close match with the point located at the street centroid. For databases vintage 2014 Q4 or newer, the input house number is returned with the candidate even if no such house number was found. The S4 code is followed by letters and dashes indicating match precision. See Interpreting S Result Codes on page 39
S5	Single close match with the point located at a street address position. The S5 code is followed by letters and dashes indicating match precision. For information about these letters, see Interpreting S Result Codes on page 39.
S7	Single match with the point located at an interpolated point along the candidate's street segment. When the potential candidate is not an address point candidate and there are no exact house number matches among other address point candidates, the S7 result is returned using address point interpolation. The point is interpolated according to the next highest or lowest address point candidate that both intersects the segment and whose house number is contained within the range of houses of the original candidate. By using known address reference points on the street segment, the S7 point can be adjusted to a more accurate position.
S8	Single close match with the point located at either the single point associated with an address point candidate or at an address point candidate that shares the same house number. No interpolation is required. S8 returns are possible with point databases only.
SX	Single close match with the point located at street intersection.

Interpreting S Result Codes

For S (street geocoded) international result codes, eight additional characters describe how closely the address matches an address in the database. The characters appear in the order listed in the following table. Any non-matched address elements are represented by a dash.

For example, the result code S5--N-SCZA represents a single close match that matched the street name, street suffix direction, town, and postcode. The dashes indicate that there was no match on house number, street prefix direction, or thoroughfare type. The match came from the Street Range Address database. This record would be geocoded at the street address position of the match candidate.

Category	Description	Example
H	House number	18
P	Street prefix direction P is present if any of these conditions are satisfied: • The candidate pre-directional matches the input pre-directional. • The candidate post-directional matches the input pre-directional after pre- and post-directionals are swapped. • The input does not have a pre-directional.	North
N	Street name	Merivale
T	Street type	St
S	Street suffix direction S in result code is present if any of these conditions are satisfied: • The candidate post-directional matches the input post-directional. • The candidate pre-directional matches the input post-directional after pre- and post-directionals are swapped. • The input does not have a post-directional.	W
C	City name	South Brisbane

Category	Description	Example
Z	Postal code	4101
A, G, or U	Database type used to obtain the match. • A—Street Range Address database. • U—Customer (user-defined) database.	A

International Postal Geocoding Result Codes (Z Codes)

Matches in the Z category indicate that a match was made at the postcode level. A postcode match is returned in either of these cases:

- You specified to match to postal code centroids. The resulting point is located at the postal code centroid with the following possible accuracy levels.
- There is no street level close match and you specified to fall back to postal code centroid.

Table 16: Postal (Z) Result Codes

Z Result Code	Description
Z1	Postal Code centroid match.
Z3	Full postal code centroid match. For Canada, this is an FSALDU centroid.

Postal level geocoded candidates return a result code beginning with the letter Z. Canada can generate a Z1 result code. Country-specific geocoders can often generate more accurate postcode results (with Z2 or Z3 result codes).

International Geographic Geocoding Result Codes (G Codes)

Geographic level geocoded candidates return a result code beginning with the letter G. The numbers following the G in the result code provides more detailed information on the accuracy of the candidate.

Table 17: Geographic (G) Result Codes

G Result Code	Description
G1	State or province centroid. match.
G2	County (district or region) centroid match.
G3	City or town (municipality) centroid match.
G4	Locality (village, suburb, or neighborhood) centroid match.

Reverse Geocoding Codes (R Codes)

Matches in the R category indicate that the record was matched by reverse geocoding. The second two characters of the R result code indicate the type of match found. R geocode results include an additional letter to indicate the dictionary from which the match was made.

Example reverse geocoding codes:

Table 18: Reverse Geocoding (R) Result Codes

Reverse Geocoding Code	Description
RS8A	Point/parcel level precision for reverse geocoding. Candidate returned from address dictionary.
RS5A	Interpolated street candidate for reverse geocoding. Candidate returned from address dictionary.
RS4A	Street centroid candidate for reverse geocoding. Candidate returned from address dictionary.

Non-match Codes

The following result codes indicate no match was made:

- **N**—No close match.
- **NX**—No close match for street intersections.

- **ND**—Spectrum™ Technology Platform could not find the geocoding database for the given postal code or municipality/state/province.

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