



# TEST REPORT

THE REPORTED TEST RESULTS RELATE ONLY TO THE ITEM(S) TESTED



Bulk Reef Supply  
6325 Sandburg Rd Ste 400  
Minneapolis, MN 55427-3629

Request ID:

R-20180524-012

Date:

06/07/2018

Credit Card

Revised:

Client Description

Estimated Results Reported In Both PPM and Percent and Report Comment Added  
Various Magnesium

Page 1 of 31

Sample No.	S-180524-027	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Acid Insoluble		<100 ppm	Insoluble residue after acid digestion*	0 ppm
Acid Insoluble		<0.010 %	Insoluble residue after acid digestion*	0 %
Al		8 ppm	ICP-MS	N/A
Al		0.0008 %	ICP-MS	N/A
As		<1 ppm	ICP-MS	0.03 ppm
As		<0.0001 %	ICP-MS	0.000003%
B		<1 ppm	ICP-MS	0.04 ppm

Methods noted with an \* fall outside of NSL's ISO 17025 Scope of Accreditation.

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Reporting Officer :

NSL Analytical Services  
4450 Cranwood Parkway  
Cleveland, Ohio 44128

Roxanne Skinner, Technical Specialist  
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<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
B		<0.0001 %	ICP-MS	0.000004%
Ca		170 ppm	ICP-MS	N/A
Ca		0.017 %	ICP-MS	N/A
Cu		<1 ppm	ICP-MS	0.9 ppm
Cu		<0.0001 %	ICP-MS	0.00009%
Fe		47 ppm	ICP-MS	N/A
Fe		0.0047 %	ICP-MS	N/A

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Sample No.	S-180524-027	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Heavy Metals as Pb		<11 ppm	Calculation	5.5 ppm
Heavy Metals as Pb		<0.0011 %	Calculation	0.00055%
Hg		<1 ppm	Cold Vapor AA	0 ppm
Hg		<0.0001 %	Cold Vapor AA	0 %
Li		<1 ppm	ICP-MS	0.4 ppm
Li		<0.0001 %	ICP-MS	0.00004%
Mg		112000 ppm	ICP	NA

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Sample No.	S-180524-027	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Mg		11.20 %	ICP	NA
P		<10 ppm	ICP-MS	7 ppm
P		<0.0010 %	ICP-MS	0.0007%
Pb		<1 ppm	ICP-MS	0.1 ppm
Pb		<0.0001 %	ICP-MS	0.00001
Si		17 ppm	ICP-MS	N/A
Si		0.0017 %	ICP-MS	N/A

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<u>Tests</u>	<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>	
Sn	<1 ppm	ICP-MS	0.09 ppm	
Sn	<0.0001 %	ICP-MS	0.000009%	
Water Insoluble	<100 ppm	Insoluble residue after water digestion*	0 ppm	
Water Insoluble	<0.010 %	Insoluble residue after water digestion*	0 %	
Zn	12 ppm	ICP-MS	N/A	
Zn	0.0012 %	ICP-MS	N/A	

## Certificate of Analysis

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<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Acid Insoluble		<100 ppm	Insoluble residue after acid digestion*	0 ppm
Acid Insoluble		<0.010 %	Insoluble residue after acid digestion*	0 %
Al		5 ppm	ICP-MS	N/A
Al		0.0005 %	ICP-MS	N/A
As		<1 ppm	ICP-MS	0.1 ppm
As		<0.0001 %	ICP-MS	0.00001%
B		21 ppm	ICP-MS	N/A

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<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
B		0.0021 %	ICP-MS	N/A
Ca		5900 ppm	ICP	NA
Ca		0.59 %	ICP	NA
Cu		<1 ppm	ICP-MS	0.3 ppm
Cu		<0.0001 %	ICP-MS	0.00003%
Fe		73 ppm	ICP-MS	N/A
Fe		0.0073 %	ICP-MS	N/A

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<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Heavy Metals as Pb		<10 ppm	Calculation	4.7 ppm
Heavy Metals as Pb		<0.0010 %	Calculation	0.00047%
Hg		<1 ppm	Cold Vapor AA	0 ppm
Hg		<0.0001 %	Cold Vapor AA	0 %
Li		6 ppm	ICP-MS	N/A
Li		0.0006 %	ICP-MS	N/A
Mg		134000 ppm	ICP	NA

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Sample No. S-180524-028

Customer ID:

<u>Tests</u>	<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Mg	13.40 %	ICP	NA
P	10 ppm	ICP-MS	N/A
P	0.0010 %	ICP-MS	N/A
Pb	<1 ppm	ICP-MS	0 ppm
Pb	<0.0001 %	ICP-MS	0%
Si	28 ppm	ICP-MS	N/A
Si	0.0028 %	ICP-MS	N/A

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<u>Tests</u>	<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>	
Sn	<1 ppm	ICP-MS	0.2 ppm	
Sn	<0.0001 %	ICP-MS	0.00002%	
Water Insoluble	<100 ppm	Insoluble residue after water digestion*	59 ppm	
Water Insoluble	<0.010 %	Insoluble residue after water digestion*	0.0059 %	
Zn	8 ppm	ICP-MS	N/A	
Zn	0.0008 %	ICP-MS	N/A	

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<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Acid Insoluble		<100 ppm	Insoluble residue after acid digestion*	35 ppm
Acid Insoluble		<0.010 %	Insoluble residue after acid digestion*	0.0035 %
Al		5 ppm	ICP-MS	N/A
Al		0.0005 %	ICP-MS	N/A
As		<1 ppm	ICP-MS	0.1 ppm
As		<0.0001 %	ICP-MS	0.00001%
B		<1 ppm	ICP-MS	0.2 ppm

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<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
B		<0.0001 %	ICP-MS	0.00002%
Ca		160 ppm	ICP-MS	N/A
Ca		0.016 %	ICP-MS	N/A
Cu		<1 ppm	ICP-MS	0 ppm
Cu		<0.0001 %	ICP-MS	0%
Fe		77 ppm	ICP-MS	N/A
Fe		0.0077 %	ICP-MS	N/A

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<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Heavy Metals as Pb		<8 ppm	Calculation	1.7 ppm
Heavy Metals as Pb		<0.0008 %	Calculation	0.00017%
Hg		<1 ppm	Cold Vapor AA	0 ppm
Hg		<0.0001 %	Cold Vapor AA	0 %
Li		<1 ppm	ICP-MS	0.2 ppm
Li		<0.0001 %	ICP-MS	0.00002%
Mg		211000 ppm	ICP	NA

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Mg		21.10 %	ICP	NA
P		13 ppm	ICP-MS	N/A
P		0.0013 %	ICP-MS	N/A
Pb		<1 ppm	ICP-MS	0 ppm
Pb		<0.0001 %	ICP-MS	0%
Si		29 ppm	ICP-MS	N/A
Si		0.0029 %	ICP-MS	N/A

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Sn	<1 ppm	ICP-MS	0.2 ppm	
Sn	<0.0001 %	ICP-MS	0.00002%	
Water Insoluble	300 ppm	Insoluble residue after water digestion*	N/A	
Water Insoluble	0.030 %	Insoluble residue after water digestion*	N/A	
Zn	7 ppm	ICP-MS	N/A	
Zn	0.0007 %	ICP-MS	N/A	

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<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Acid Insoluble		<100 ppm	Insoluble residue after acid digestion*	0 ppm
Acid Insoluble		<0.010 %	Insoluble residue after acid digestion*	0 %
Al		11 ppm	ICP-MS	N/A
Al		0.0011 %	ICP-MS	N/A
As		<1 ppm	ICP-MS	0.1 ppm
As		<0.0001 %	ICP-MS	0.00001%
B		2 ppm	ICP-MS	N/A

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Reporting Officer :

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4450 Cranwood Parkway  
Cleveland, Ohio 44128

Roxanne Skinner, Technical Specialist  
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# TEST REPORT

THE REPORTED TEST RESULTS RELATE ONLY TO THE ITEM(S) TESTED



Bulk Reef Supply  
6325 Sandburg Rd Ste 400  
Minneapolis, MN 55427-3629

Request ID: R-20180524-012  
Date: 06/07/2018  
Credit Card

Revised:

Client Description Estimated Results Reported In Both PPM and Percent and Report Comment Added  
Various Magnesium

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Sample No.	S-180524-030	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
B		0.0002 %	ICP-MS	N/A
Ca		660 ppm	ICP-MS	N/A
Ca		0.066 %	ICP-MS	N/A
Cu		<1 ppm	ICP-MS	0.03 ppm
Cu		<0.0001 %	ICP-MS	0.000003%
Fe		46 ppm	ICP-MS	N/A
Fe		0.0046 %	ICP-MS	N/A

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Minneapolis, MN 55427-3629

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Sample No.	S-180524-030	Customer ID:		
<u>Tests</u>	<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>	
Heavy Metals as Pb	<8 ppm	Calculation	2.0 ppm	
Heavy Metals as Pb	<0.0008 %	Calculation	0.0002%	
Hg	<1 ppm	Cold Vapor AA	0 ppm	
Hg	<0.0001 %	Cold Vapor AA	0 %	
Li	<1 ppm	ICP-MS	0.9 ppm	
Li	<0.0001 %	ICP-MS	0.00009%	
Mg	113000 ppm	ICP	NA	

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Various Magnesium

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Sample No.	S-180524-030	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Mg		11.30 %	ICP	NA
P		<10 ppm	ICP-MS	8 ppm
P		<0.0010 %	ICP-MS	0.0008%
Pb		<1 ppm	ICP-MS	0 ppm
Pb		<0.0001 %	ICP-MS	0%
Si		34 ppm	ICP-MS	N/A
Si		0.0034 %	ICP-MS	N/A

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Sample No.	S-180524-030	Customer ID:		
<u>Tests</u>	<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>	
Sn	<1 ppm	ICP-MS	0.1 ppm	
Sn	<0.0001 %	ICP-MS	0.00001%	
Water Insoluble	<100 ppm	Insoluble residue after water digestion*	5 ppm	
Water Insoluble	<0.010 %	Insoluble residue after water digestion*	0.0005 %	
Zn	4 ppm	ICP-MS	N/A	
Zn	0.0004 %	ICP-MS	N/A	

## Certificate of Analysis

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Various Magnesium

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Sample No.	S-180524-031	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Acid Insoluble		<100 ppm	Insoluble residue after acid digestion*	9 ppm
Acid Insoluble		<0.010 %	Insoluble residue after acid digestion*	0.0009 %
Al		10 ppm	ICP-MS	N/A
Al		0.0010 %	ICP-MS	N/A
As		<1 ppm	ICP-MS	0.9 ppm
As		<0.0001 %	ICP-MS	0.00009%
B		25 ppm	ICP-MS	N/A

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Various Magnesium

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Sample No.	S-180524-031	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
B		0.0025 %	ICP-MS	N/A
Ca		8100 ppm	ICP	NA
Ca		0.81 %	ICP	NA
Cu		5 ppm	ICP-MS	N/A
Cu		0.0005 %	ICP-MS	N/A
Fe		17 ppm	ICP-MS	N/A
Fe		0.0017 %	ICP-MS	N/A

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Various Magnesium

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Sample No.	S-180524-031	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Heavy Metals as Pb		<13 ppm	Calculation	8.2 ppm
Heavy Metals as Pb		<0.0013 %	Calculation	0.00082%
Hg		<1 ppm	Cold Vapor AA	0 ppm
Hg		<0.0001 %	Cold Vapor AA	0 %
Li		8 ppm	ICP-MS	N/A
Li		0.0008 %	ICP-MS	N/A
Mg		116000 ppm	ICP	NA

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Various Magnesium

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Sample No.	S-180524-031	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Mg		11.60 %	ICP	NA
P		15 ppm	ICP-MS	N/A
P		0.0015 %	ICP-MS	N/A
Pb		<1 ppm	ICP-MS	0 ppm
Pb		<0.0001 %	ICP-MS	0%
Si		49 ppm	ICP-MS	N/A
Si		0.0049 %	ICP-MS	N/A

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Various Magnesium

Page 25 of 31

Sample No.	S-180524-031	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Sn		<1 ppm	ICP-MS	0.4 ppm
Sn		<0.0001 %	ICP-MS	0.00004%
Water Insoluble		<100 ppm	Insoluble residue after water digestion*	0 ppm
Water Insoluble		<0.010 %	Insoluble residue after water digestion*	0 %
Zn		5 ppm	ICP-MS	N/A
Zn		0.0005 %	ICP-MS	N/A

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Various Magnesium

Page 26 of 31

Sample No.	S-180524-032	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Acid Insoluble		<100 ppm	Insoluble residue after acid digestion*	10 ppm
Acid Insoluble		<0.010 %	Insoluble residue after acid digestion*	0.0010 %
Al		7 ppm	ICP-MS	N/A
Al		0.0007 %	ICP-MS	N/A
As		2 ppm	ICP-MS	N/A
As		0.0002 %	ICP-MS	N/A
B		760 ppm	ICP-MS	N/A

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Various Magnesium

Page 27 of 31

Sample No.	S-180524-032	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
B		0.076 %	ICP-MS	N/A
Ca		240 ppm	ICP-MS	N/A
Ca		0.024 %	ICP-MS	N/A
Cu		<1 ppm	ICP-MS	0.2 ppm
Cu		<0.0001 %	ICP-MS	0.00002%
Fe		34 ppm	ICP-MS	N/A
Fe		0.0034 %	ICP-MS	N/A

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Page 28 of 31

Sample No.	S-180524-032	Customer ID:		
<u>Tests</u>	<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>	
Heavy Metals as Pb	<10 ppm	Calculation	5.0 ppm	
Heavy Metals as Pb	<0.0010 %	Calculation	0.0005%	
Hg	<1 ppm	Cold Vapor AA	0 ppm	
Hg	<0.0001 %	Cold Vapor AA	0 %	
Li	1100 ppm	ICP-MS	N/A	
Li	0.11 %	ICP-MS	N/A	
Mg	114000 ppm	ICP	NA	

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Sample No.	S-180524-032	Customer ID:		
<u>Tests</u>		<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>
Mg		11.40 %	ICP	NA
P		15 ppm	ICP-MS	N/A
P		0.0015 %	ICP-MS	N/A
Pb		<1 ppm	ICP-MS	0 ppm
Pb		<0.0001 %	ICP-MS	0%
Si		75 ppm	ICP-MS	N/A
Si		0.0075 %	ICP-MS	N/A

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<u>Tests</u>	<u>Results/Units</u>	<u>Method</u>	<u>Estimated Results</u>	
Sn	<1 ppm	ICP-MS	0.2 ppm	
Sn	<0.0001 %	ICP-MS	0.00002%	
Water Insoluble	<100 ppm	Insoluble residue after water digestion*	75 ppm	
Water Insoluble	<0.010 %	Insoluble residue after water digestion*	0.0075 %	
Zn	4 ppm	ICP-MS	N/A	
Zn	0.0004 %	ICP-MS	N/A	

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