

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT3292723

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT	
<b>NATURE OF CONVEYANCE:</b>	SECURITY INTEREST	
<b>CONVEYING PARTY DATA</b>		
<b>Name</b>		<b>Execution Date</b>
CIRIS ENERGY, INC.		03/31/2015
<b>RECEIVING PARTY DATA</b>		
<b>Name:</b>	TRIPLEPOINT CAPITAL LLC	
<b>Street Address:</b>	2755 SAND HILL ROAD, SUITE 150	
<b>City:</b>	MENLO PARK	
<b>State/Country:</b>	CALIFORNIA	
<b>Postal Code:</b>	94025	
<b>PROPERTY NUMBERS Total: 27</b>		
<b>Property Type</b>	<b>Number</b>	
Patent Number:	8459349	
Patent Number:	8176978	
Application Number:	13913731	
Patent Number:	8459350	
Application Number:	13889754	
Patent Number:	8151876	
Application Number:	12584300	
Application Number:	12565839	
Application Number:	12965285	
Application Number:	13513940	
Application Number:	13091730	
Application Number:	13696646	
Application Number:	61792798	
Application Number:	61823023	
Application Number:	61862717	
Application Number:	61929401	
Application Number:	62045163	
Application Number:	62049684	
Application Number:	62045169	
Application Number:	62057180	

PATENT

Property Type	Number
Application Number:	62045172
Application Number:	62057183
Application Number:	62045771
Application Number:	62054592
Application Number:	62045181
Application Number:	62090533
Application Number:	62114299

#### CORRESPONDENCE DATA

**Fax Number:** (310)277-4730

*Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.*

**Phone:** (310) 284-6133

**Email:** jsbrown@mwe.com

**Correspondent Name:** GARY B. ROSENBAUM

**Address Line 1:** MCDERMOTT WILL & EMERY LLP

**Address Line 2:** 2049 CENTURY PARK EAST, SUITE 3800

**Address Line 4:** LOS ANGELES, CALIFORNIA 90067

**ATTORNEY DOCKET NUMBER:** 082853-0010

**NAME OF SUBMITTER:** GARY B. ROSENBAUM

**SIGNATURE:** /Gary B. Rosenbaum/

**DATE SIGNED:** 04/01/2015

#### Total Attachments: 9

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## INTELLECTUAL PROPERTY SECURITY AGREEMENT

This **Intellectual Property Security Agreement** dated as of March 31, 2015 (as the same may be amended, restated, supplemented or otherwise modified from time to time, this "Agreement"), is by and among CIRIS ENERGY, INC., a Delaware corporation ("Grantor"), and TRIPLEPOINT CAPITAL LLC, a Delaware limited liability company ("TriplePoint"), as agent (in such capacity, "Agent") on behalf of LIGHTHOUSE CAPITAL PARTNERS VI, L.P., a Delaware limited partnership for itself and as a lender ("Lighthouse") and TRIPLEPOINT CAPITAL LLC, a Delaware limited liability company, for itself, as a lender, and as agent ("TriplePoint", along with Lighthouse each a "Lender", and collectively, "Lenders").

Grantor, Agent, and Lenders have entered into a Loan and Security Agreement dated as of October 31, 2011, as amended by Amendment No. 1 to Loan and Security Agreement dated as of May 18, 2012 and the Restructuring Agreement dated as of March 31, 2015 (such Loan and Security Agreement, as amended or otherwise modified by Amendment No. 1 and the Restructuring Agreement and as may be further amended, restated or otherwise modified, the "Loan Agreement"). Matters of construction established in the Loan Agreement shall be applied herein as established therein. Capitalized terms not otherwise defined herein shall have the same meaning as set forth in the Loan Agreement. Pursuant to the Loan Agreement, Grantor has agreed to grant to Agent, for the benefit of Agent and Lenders, a lien on and a security interest in all the present and future rights, title, and interest that Grantor may now have or hereafter acquire in all Patents, Trademarks, Copyrights, Patent Licenses, Trademark Licenses, Copyright Licenses, and applications for Patents, Trademarks and Copyrights.

In consideration of the mutual covenants and agreements contained in the Loan Agreement and this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are acknowledged, Grantor and Agent hereby agree as follows:

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### 1. GRANT OF SECURITY INTEREST

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Grantor hereby grants to Agent, for the benefit of Agent and Lenders, a lien upon and continuing security interest in all of Grantor's right, title, and interest in, to and under all of the following (all of the following items of property collectively will be referred to as the "Intellectual Property Collateral"), whether now existing or hereafter arising or acquired:

- ⇒ all Patents, Patent Licenses, and Patent applications, including specifically those listed on the attached **Schedule A**, together with any reissues, divisions, continuations, renewals, extensions and continuations thereof;
- ⇒ all Trademarks, Trademark Licenses, and trademark applications, including specifically those listed on the attached **Schedule B** together with any renewals thereof;
- ⇒ all Copyrights, Copyright Licenses, and applications for Copyrights, including specifically those listed on the attached **Schedule C**;
- ⇒ the right to sue for past, present and future infringements of the foregoing and all rights corresponding thereto throughout the world and all re-issues, divisions continuations, renewals, extensions and continuations-in-part thereof; and
- ⇒ all proceeds of the foregoing.

Notwithstanding the foregoing, the term "Intellectual Property Collateral" shall not include any items excluded from the term "Collateral" as defined in the Loan Agreement pursuant to Section 4.1(b) of the Loan Agreement.

Grantor hereby represents and warrants to Lender that **Schedules A, B and C** attached hereto set forth any and all of Grantor's Patents, Trademarks, Copyrights, and applications for Patents, Trademarks and Copyrights.

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**2. LOAN AGREEMENT**

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This security interest is granted to secure the Obligations under the Loan Agreement. All the capitalized terms used but not otherwise defined are used in this Agreement with the same meaning as defined in the Loan Agreement.

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**3. LENDER'S RIGHT TO SUE**

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During the continuance of an Event of Default, subject to the terms of the Loan Agreement, Agent shall have the right, but shall in no way be obligated, to bring suit in Agent's own name to enforce any of Grantor's rights in the Intellectual Property Collateral. If Agent commences any such suit, Grantor shall, at Agent's request, do all lawful acts and execute and deliver all proper documents or information that may be necessary or reasonably desirable to aid Agent. Grantor shall promptly, upon demand, reimburse and indemnify Agent for all of Agent's costs and expenses, including reasonable attorneys' fees, related to Agent's exercise of the above mentioned rights provided, that Agent shall not be entitled reimbursement or indemnification under this Section 3 in respect of any suit, action, proceeding, claim, damage, loss, liability or expense resulting from Agent's gross negligence or willful misconduct.

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**4. FURTHER ASSURANCES**

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Grantor shall from time to time execute, deliver and obtain any instruments or documents as Agent may reasonably request, and take all further action that may be reasonably necessary or desirable, or that Agent may reasonably request, to carry out more effectively the provisions and purposes of this Agreement or any other related agreements or to confirm, perfect, preserve and protect the liens granted to Agent.

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**5. RELEASE; TERMINATION**

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Upon the earlier to occur of (a) the final Maturity Date and (b) the date on which Grantor has issued and sold additional shares of its Preferred Stock for aggregate gross cash proceeds of at least Six Million Five Hundred Thousand Dollars (\$6,500,000) (excluding any amounts received upon conversion or cancellation of indebtedness), this Agreement shall terminate. Upon termination of this Agreement the Intellectual Property Collateral shall be released from the lien of this Agreement and Agent shall execute, acknowledge, and deliver to Grantor, at Grantor's cost, an instrument in writing in recordable form releasing the grant, lien and security interest in the Intellectual Property Collateral under this Agreement.

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**6. MODIFICATION**

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This Agreement can only be altered, amended or modified in a writing signed by Agent and Grantor. Notwithstanding the foregoing however, Grantor hereby irrevocably appoints Agent (and any of Agent's designated officers, agents or employees) as Grantor's true and lawful attorney to modify, in Agent's sole discretion, this Agreement without first obtaining Grantor's approval of or signature to such modification by amending **Schedules A, B and C** to this Agreement, as appropriate, to include reference to any right, title or interest in any Intellectual Property Collateral acquired by such Grantor before or after the execution hereof or to delete any reference to any right, title or interest in any Intellectual Property Collateral in which Grantor no longer has or claims to have any right, title or interest. The appointment of Agent as Grantor's attorney in fact, and each and every one of Agent's rights and powers, being coupled with an interest, is irrevocable until the termination of this Agreement as set forth in Section 5 above.

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**7. BINDING EFFECT; REMEDIES NOT EXCLUSIVE**

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This Agreement shall be binding upon Grantor and Grantor's respective successors and assigns, and shall inure to the benefit of Agent and Lenders, and Agent and Lenders' successors and assigns.

The rights and remedies of Agent and Lenders with respect to the security interest granted hereby are in addition to those set forth in the Loan Agreement and the other Loan Documents, and those which are now or hereafter available to Agent and Lenders as a matter of law or equity. Each of the rights, powers and remedies of Agent and Lenders provided for herein or in the Loan Agreement or any of the other Loan Documents, or now or hereafter existing at law or in equity,

shall be cumulative and concurrent and shall be in addition to every right, power or remedy provided for herein and the exercise by Agent and Lenders of any one or more of the rights, powers or remedies provided for in this Agreement, the Loan Agreement or any of the other Loan Documents, or now or hereafter existing at law or in equity, shall not preclude the simultaneous or later exercise by any person, including Agent and Lenders, of any or all other rights, powers or remedies.

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**8. GOVERNING LAW; COUNTERPARTS**

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This Agreement shall be deemed made and accepted in and shall be governed by and construed in accordance with the laws of the State of California, and (where applicable) the laws of the United States of America.

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original but all of which together shall constitute the same instrument.

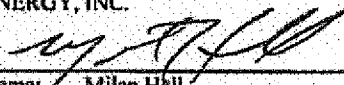
*(Signature Page to Follow)*

IN WITNESS WHEREOF, Grantor and Agent have duly executed this Agreement as of the date first set forth above.

"Grantor"

CIRIS ENERGY, INC.

By:

  
Name: Milan Hall  
Title: Vice President of Finance  
and Controller

"Agent"

TRIPLEPOINT CAPITAL LLC

By:

Name: \_\_\_\_\_  
Title: \_\_\_\_\_

IP Security Agreement

IN WITNESS WHEREOF, Grantor and Agent have duly executed this Agreement as of the date first set forth above.

“Grantor”

CIRIS ENERGY, INC.

By:

Name: Milan Hall  
Title: VP Finance and Controller

“Agent”

TRIPLEPOINT CAPITAL LLC

By:

Name: Sajal Srivastava  
Title: President

**SCHEDULE A****To Intellectual Property Security Agreement**

<b>Title</b>	<b>Country/ Type</b>	<b>Serial No.</b>	<b>Issued Patent Number</b>
Stimulation of Biogenic Gas Generation in Deposits of Carbonaceous Material	US Granted	12/455,431	8,459,349
Stimulation of Biogenic Gas Generation in Deposits of Carbonaceous Material	US CON Pending	13/913,731	
Method for Optimizing In-Situ Bioconversion of Carbon-Bearing Formations	US Granted	12/459,416	8,176,978
Method for Optimizing In-Situ Bioconversion of Carbon-Bearing Formations	US CON Granted	13/466,187	8,459,350
Method for Optimizing In-Situ Bioconversion of Carbon-Bearing Formations	US CON Pending	13/889,754	
Well Stimulation	US Granted	12/462,682	8,151,876
Solubilization of Algae and Algal Materials	US Pending	12/584,300	
Method for Evaluation, Design and Optimization of In-situ Bioconversion Processes	US Pending	12/565,839	
Biogasification of Coal to Methane and Other Useful Products	US Pending	12/965,285	
Solubilization of Coal and Bioconversion of Coal to Methane and Other Useful Products	US Pending	13/513,940	
Solubilization of Carbonaceous Materials and Conversion to Hydrocarbons and Other Useful Products	US Pending	13/091,730	
In-situ Stimulation of Bioconversion of Carbon-bearing Formations	US Pending	13/696,646	
Processes for Bioconversion of Carbon Bearing Materials	US Provisional	61/792,798	
Pretreatment of Carbonaceous Feedstocks	US Provisional	61/823,023	
Treatment of Carbonaceous Feedstocks	US Provisional	61/862,717	
Treatment of Carbonaceous Feedstocks	US Provisional	61/929,401	
Genetically Modified Microbes for the Biological Conversion of Carbonaceous Materials to cis,cis-Muconic Acid	US Provisional	62/045,163	
Genetically Modified Microbes For The Biological Conversion of Carbonaceous Materials to Alkanes	US Provisional	62/049684	
Genetically Modified Microbes For The Biological Conversion of Carbonaceous Materials to Fatty Acids	US Provisional	62/045,169	
Expression of Heterologous Microbial Oxidative Enzymes to Increase the Amount of Biologically Labile Carbon from Pretreated Coal	US Provisional	62/057,180	
Genetically Modified Microbes For The Biological Conversion of Carbonaceous Materials to Protocatechuic Acid	US Provisional	62/045,172	
Genetically Modified Microbes For The Biological Conversion of Carbonaceous Materials to p-aminobenzoic Acid	US Provisional	62/057,183	



Bioplastic Production from Non-Sugar Carbonaceous Material	US Provisional	62/045,771	
Genetically Modified Microbes For The Biological Conversion of Carbonaceous Materials to Isobutanol and Isoamyl Alcohol	US Provisional	62/054,592	
Production of 3-hydroxypropionic Acid From Carbonaceous Material	US Provisional	62/045,181	
Genetically Modified Microbes For The Biological Conversion of Carbonaceous Materials to Diols	US Provisional	62/090,533	
Depolymerization Process	US Provisional	62/114,299	
Discriminate Mass Transfer in a Wet Oxidation System	US Provisional	Pending	
Genetically Modified Microbes For The Biological Conversion of Carbonaceous Materials to Ethanol	US Provisional	Pending	

**SCHEDULE B**

**To Intellectual Property Security Agreement**

**TRADEMARKS AND TRADEMARK APPLICATIONS**

**TRADEMARKS**

**(UNREGISTERED)**

<i>Grantor</i>	<i>Trademark Name</i>	<i>Date Filed or Issued</i>	<i>Serial Number</i>	<i>Status</i>
Ciris Energy, Inc.	ESBC	N/A	N/A	Unregistered
Ciris Energy, Inc.	Coal Biorefinery	N/A	N/A	Unregistered
Ciris Energy, Inc.	ISBC	N/A	N/A	Unregistered
Ciris Energy, Inc.	Ciris Energy	N/A	N/A	Unregistered
Ciris Energy, Inc.	Flame (image)	N/A	N/A	Unregistered
Ciris Energy, Inc.	Logo (image)	N/A	N/A	Unregistered

**TRADEMARK APPLICATIONS**

<i>Grantor</i>	<i>Trademark Name</i>	<i>Date Filed</i>	<i>Serial Number</i>	<i>Status</i>
None				

**SCHEDULE C**

**To Intellectual Property Security Agreement**

**COPYRIGHTS, COPYRIGHT APPLICATIONS AND COPYRIGHT REGISTRATIONS**

**COPYRIGHT REGISTRATIONS**

Registration Number	Title	Registration Date	V&A No.
None			

**APPLICATIONS FOR COPYRIGHT REGISTRATIONS**

Title	Date Filed	V&A No.
None		