

PATENT ASSIGNMENT

Electronic Version v1.1  
Stylesheet Version v1.1

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	SECURITY AGREEMENT
CONVEYING PARTY DATA	
Name	Execution Date
Red Leaf Resources, Inc., dba Ecoshale and Ecoshale Energy	07/02/2009
RECEIVING PARTY DATA	
Name:	CARDINAL ENERGY HOLDINGS, LLC
Street Address:	1879 East Longview Drive
City:	Salt Lake City
State/Country:	UTAH
Postal Code:	84124
PROPERTY NUMBERS Total: 20	
Property Type	Number
Application Number:	60900505
Application Number:	60906634
Application Number:	60906759
Application Number:	60930711
Application Number:	61027290
Application Number:	61152141
Application Number:	61152146
Application Number:	61152150
Application Number:	61152152
Application Number:	61152157
Application Number:	61152180
Application Number:	61152207
Application Number:	61027729
Application Number:	61152220
Application Number:	12367405

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PATENT  
REEL: 022909 FRAME: 0653

Application Number:	12028569
Application Number:	12028592
Application Number:	12028621
Application Number:	12028604
PCT Number:	US0853434

#### CORRESPONDENCE DATA

Fax Number: (602)382-6070

*Correspondence will be sent via US Mail when the fax attempt is unsuccessful.*

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Email: dashcraft@swlaw.com

Correspondent Name: SNELL & WILMER L.L.P. (Main)

Address Line 1: ONE ARIZONA CENTER, 400 E VAN BUREN ST

Address Line 2: J. Damon Ashcraft

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ATTORNEY DOCKET NUMBER:	51976.0009
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NAME OF SUBMITTER:	J. Damon Ashcraft
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Total Attachments: 6

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## PATENT SECURITY AGREEMENT

THIS PATENT SECURITY AGREEMENT (this "*Agreement*") is made as of July 2, 2009, by and among RED LEAF RESOURCES, INC., a Delaware corporation d/b/a ECOSHALE and ECOSHALE ENERGY ("*Debtor*"), and CARDINAL ENERGY HOLDINGS, LLC, a Delaware limited liability company ("*Secured Party*").

Debtor and Secured Party hereby agree as follows:

1. Definitions; Interpretation.

(a) Terms Defined in Security Agreement. All capitalized terms used in this Agreement and not otherwise defined herein shall have the meanings assigned to them in that certain Security Agreement of even date herewith between Debtor and Secured Party.

(b) Certain Defined Terms. As used in this Agreement, the following terms shall have the following meanings:

"*Collateral*" has the meaning set forth in Section 2.

"*PTO*" means the United States Patent and Trademark Office.

"*Security Agreement*" means that certain Security Agreement of even date herewith between Debtor and Secured Party.

"*UCC*" means the Uniform Commercial Code as in effect in the State of Utah.

(c) Terms Defined in UCC. Where applicable in the context of this Agreement and except as otherwise defined herein, terms used in this Agreement shall have the meanings assigned to them in the UCC.

(d) Construction. In this Agreement, the following rules of construction and interpretation shall be applicable: (i) no reference to "proceeds" in this Agreement authorizes any sale, transfer, or other disposition of any Collateral by Debtor; (ii) "includes" and "including" are not limiting; (iii) "or" is not exclusive; and (iv) "all" includes "any" and "any" includes "all." To the extent not inconsistent with the foregoing, the rules of construction and interpretation applicable to the Security Agreement shall also be applicable to this Agreement and are incorporated herein by this reference.

2. Security Interest.

(a) Grant of Security Interest. As security for the payment and performance of the Obligations, Debtor hereby grants to Secured Party a security interest in and to all of Debtor's right, title and interest in, to and under the following property, in each case whether now or hereafter existing or arising or in which Debtor now has or hereafter owns, acquires or develops an interest and wherever located (collectively, the "*Collateral*"):

(i) all patents and patent applications, domestic or foreign, all licenses relating to any of the foregoing and all income and royalties with respect to any licenses (including such patents and patent applications as described in **Schedule A**) all rights to sue for past, present or future infringement thereof, all rights arising therefrom and pertaining thereto and all reissues, divisions, continuations, renewals, extensions and continuations-in-part thereof;

(ii) all general intangibles and all intangible intellectual or other similar property of Debtor of any kind or nature; and

(iii) all proceeds of any and all of the foregoing Collateral (including license royalties, rights to payment, accounts receivable and proceeds of infringement suits) and, to the extent not otherwise included, all payments under insurance (whether or not Secured Party is the loss payee thereof) or any indemnity, warranty or guaranty payable by reason of loss or damage to or otherwise with respect to the foregoing Collateral.

(b) Continuing Security Interest. Debtor agrees that this Agreement shall create a continuing security interest in the Collateral which shall remain in effect until terminated in accordance with **Section 11.**

3. Supplement to Security Agreement. This Agreement has been entered into in conjunction with the security interests granted to Secured Party under the Security Agreement or other security documents referred to therein. The rights and remedies of Secured Party with respect to the security interests granted herein are without prejudice to, and are in addition to those set forth in the Security Agreement or any other security documents referred to therein, all terms and provisions of which are incorporated herein by reference.

4. Representations and Warranties. Debtor represents and warrants to Secured Party that a true and correct list of all of the existing Collateral consisting of all patents and patent applications owned by Debtor, in whole or in part, is set forth in **Schedule A.**

5. Further Acts. On a continuing basis, Debtor shall make, execute, acknowledge and deliver, and file and record in the proper filing and recording places, all such instruments and documents, and take all such action as may be necessary or advisable or may be requested by Secured Party to carry out the intent and purposes of this Agreement, or for assuring, confirming or protecting the grant or perfection of the security interest granted or purported to be granted hereby, to ensure Debtor's compliance with this Agreement or to enable Secured Party to exercise and enforce its rights and remedies hereunder with respect to the Collateral, including any documents for filing with the PTO or any applicable state office. Secured Party may record this Agreement, an abstract thereof, or any other document describing Secured Party's interest in the Collateral with the PTO, at the expense of Debtor. In addition, Debtor authorizes Secured Party to file financing statements describing the Collateral in any UCC filing office deemed appropriate by Secured Party. If the Debtor shall at any time hold or acquire a commercial tort claim arising with respect to the Collateral, the Debtor shall immediately notify Secured Party in a writing signed by the Debtor of the brief details thereof and grant to the Secured Party in such writing a security interest therein and in the proceeds thereof, all upon the terms of this Agreement, with such writing to be in form and substance satisfactory to the Secured Party.

6. Authorization to Supplement. If Debtor shall obtain rights to any new patentable inventions or become entitled to the benefit of any patent application or patent for any reissue, division, or continuation, of any patent, the provisions of this Agreement shall automatically apply thereto. Debtor shall give prompt notice in writing to Secured Party with respect to any such new patent rights. Without limiting Debtor's obligations under this Section, Debtor authorizes Secured Party unilaterally to modify this Agreement by amending **Schedule A** to include any such new patent rights. Notwithstanding the foregoing, no failure to so modify this Agreement or amend **Schedule A** shall in any way affect, invalidate or detract from Secured Party's continuing security interest in all Collateral, whether or not listed on **Schedule A.**

7. Binding Effect. This Agreement shall be binding upon, inure to the benefit of and be enforceable by Debtor, Secured Party and their respective successors and assigns. Debtor may not assign, transfer, hypothecate or otherwise convey its rights, benefits, obligations or duties hereunder except as specifically permitted by the Security Agreement.

8. Governing Law. This Agreement shall be governed by, and construed in accordance with, the law of the State of Utah, except as required by mandatory provisions of law or to the extent the perfection or priority of the security interests hereunder, or the remedies hereunder, in respect of any Collateral are governed by the law of a jurisdiction other than Utah.

9. Entire Agreement; Amendment. This Agreement and the Security Agreement, together with the Schedules hereto and thereto, contains the entire agreement of the parties with respect to the subject matter hereof and supersedes all prior drafts and communications relating to such subject matter. Neither this Agreement nor any provision hereof may be modified, amended or waived except by the written agreement of the parties, as provided in the Security Agreement. Notwithstanding the foregoing, Secured Party unilaterally may re-execute this Agreement or modify, amend or supplement the Schedules hereto as provided in Section 6 hereof. To the extent that any provision of this Agreement conflicts with any provision of the Security Agreement, the provision giving Secured Party greater rights or remedies shall govern, it being understood that the purpose of this Agreement is to add to, and not detract from, the rights granted to Secured Party under the Security Agreement.

10. Counterparts. This Agreement may be executed in any number of counterparts and by different parties hereto in separate counterparts, each of which when so executed shall be deemed to be an original and all of which taken together shall constitute but one and the same agreement. Delivery of an executed counterpart of this Agreement by facsimile shall be equally as effective as delivery of a manually executed counterpart. Any party hereto delivering a counterpart of this Agreement by facsimile shall also deliver a manually executed counterpart, but the failure to so deliver a manually executed counterpart shall not affect the validity, enforceability, or binding effect hereof.

11. Termination. Upon payment and performance in full of all Obligations, the security interests created by this Agreement shall terminate and Secured Party (at Debtor's expense) shall promptly execute and deliver to Debtor such documents and instruments reasonably requested by Debtor as shall be necessary to evidence termination of all such security interests given by Debtor to Secured Party hereunder, including cancellation of this Agreement by written notice from Secured Party to the PTO.

12. No Inconsistent Requirements. Debtor acknowledges that this Agreement and the other documents, agreements and instruments entered into or executed in connection herewith may contain covenants and other terms and provisions variously stated regarding the same or similar matters, and Debtor agrees that all such covenants, terms and provisions are cumulative and all shall be performed and satisfied in accordance with their respective terms.

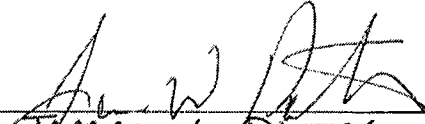
13. Severability. If one or more provisions contained in this Agreement shall be invalid, illegal or unenforceable in any respect in any jurisdiction or with respect to any party, such invalidity, illegality or unenforceability in such jurisdiction or with respect to such party shall, to the fullest extent permitted by applicable law, not invalidate or render illegal or unenforceable any such provision in any other jurisdiction or with respect to any other party, or any other provisions of this Agreement.

14. Notices. All notices and other communications hereunder shall be in writing and shall be mailed, sent or delivered in accordance with the Security Agreement.

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IN WITNESS WHEREOF, intending to be legally bound, the parties hereto have caused this Agreement to be duly executed as of the date first above written.

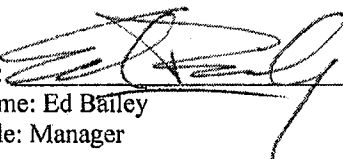
**RED LEAF RESOURCES, INC.**  
a Delaware corporation d/b/a **ECOSHALE** and  
**ECOSHALE ENERGY**

By:   
Name: JAMES W. PATTEN  
Title: CEO

*"Debtor"*

**CARDINAL ENERGY HOLDINGS, LLC**  
a Delaware limited liability company

By: **CARDINAL LAND MANAGEMENT, L.L.C.**  
a Utah limited liability company, its Manager

By:   
Name: Ed Bailey  
Title: Manager

*"Secured Party"*

SCHEDULE A  
to Patent Security Agreement

Debtor: **RED LEAF RESOURCES, INC.**, a Delaware corporation

Secured Party: **CARDINAL ENERGY HOLDINGS, LLC**, a Delaware limited liability company

**PATENTS**

*U.S. Patents – Provisional*

<u>Title</u>	<u>Application No.</u>	<u>Filing Date</u>
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	60/900,505	February 9, 2007
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	60/906,634	March 12, 2007
METHODS FOR RECOVERING HYDROCARBONS FROM WATER CONTAINING HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	60/906,759	March 12, 2007
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	60/930,711	May 17, 2007
METHODS OF TRANSPORTING HEAVY HYDROCARBONS	61/027,290	February 8, 2008
CONVECTIVE HEAT SYSTEMS FOR RECOVERY OF HYDROCARBONS FROM ENCAPSULATED PERMEABILITY CONTROL INFRASTRUCTURES	61/152,141	February 12, 2009
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS MAINTAINED UNDER POSITIVE PRESSURE	61/152,146	February 12, 2009
CORRUGATED HEATING CONDUIT AND METHOD OF USING IN THERMAL EXPANSION AND SUBSIDENCE MITIGATION	61/152,150	February 12, 2009
VAPOR COLLECTION AND BARRIER SYSTEMS FOR ENCAPSULATED CONTROL INFRASTRUCTURES	61/152,152	February 12, 2009
INTERMEDIATE VAPOR COLLECTION WITHIN ENCAPSULATED CONTROL INFRASTRUCTURES	61/152,157	February 12, 2009
ARTICULATED CONDUIT LINKAGE SYSTEM	61/152,180	February 12, 2009
METHODS OF RECOVERING MINERALS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	61/152,207	February 12, 2009
METHODS OF TRANSPORTING HEAVY HYDROCARBONS	61/027,729	February 8, 2008
CARBON MANAGEMENT AND SEQUESTRATION FROM ENCAPSULATED CONTROL INFRASTRUCTURES	61/152,220	February 12, 2009

***U.S. Patents – Non-Provisional***

<u>Title</u>	<u>Application No.</u>	<u>Filing Date</u>
METHODS OF TRANSPORTING HEAVY HYDROCARBONS	12/367,405	February 6, 2009
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	12/028,569	February 8, 2008
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE HAVING PERMEABLE WALLS AND ASSOCIATED SYSTEMS	12/028,592	February 8, 2008
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL WITH REDUCED NON-CARBONACEOUS LEACHATE AND CO <sub>2</sub> AND ASSOCIATED SYSTEMS	12/028,621	February 8, 2008
METHODS OF RECOVERING HYDROCARBONS FROM WATER-CONTAINING HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE	12/028,604	February 8, 2008

***Foreign Patents***

<u>Title</u>	<u>Application No.</u>	<u>Country</u>
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	52/2008	Jordan
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	00257-2008	Venezuela

***PCT Patent Applications***

<u>Title</u>	<u>Application No.</u>	<u>Date</u>
METHODS OF RECOVERING HYDROCARBONS FROM HYDROCARBONACEOUS MATERIAL USING A CONSTRUCTED INFRASTRUCTURE AND ASSOCIATED SYSTEMS	PCT/US08/53434	February 8, 2008

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