



**5-6 BofS Agenda #21 - Sludge Ords / Action & Inaction**  
**David Broadwater** to: fmecham, bgibson, ahill, cray, darnold  
Cc: cr\_board\_clerk

05/01/2014 03:19 PM

1 attachment



BofS Int-Perm Ord 3-12-13.pdf

SLO County BofS;

re: 5-6-14 Agenda Item # 21 / Sewage Sludge Land Application Ordinances  
Support for Interim Moratorium 4-Year Extension until 2018  
Opposition to Premature Permanent Ordinance Work Plan - Without Alternatives  
Analysis

CSI supports the staff recommendation to extend the Interim Moratorium ordinance until 2018. SLO County is not prepared to proceed with a permanent ordinance; and previous extensions have proven effective at preventing excessive pollution while ultimate policy is being designed. While the IM ordinance actually allows sewage sludge land application at historical levels, nobody has sought permission to do so since its enactment by the BofS in 2004. Having proven effective at maintaining the status quo, the record of the ordinance validates its own CEQA Negative Declaration. The reduction in land application of sewage sludge since the 2004 adoption of the IM ordinance is recognized as environmentally benign.

Rather than submitting new comments on this matter, CSI resubmits its 3-12-13 comments to the BofS (attached below).

**Recommendation:**

Take the three actions recommended by staff: waive ordinance reading, approve Interim Moratorium ordinance extension, and concur with NegDec: i.e., extend the IM until 2018.

**Recommendation:**

Reject the Work Plan presented by staff to "Continue Development of a Permanent Land Application of Biosolids Ordinance". SLO County has yet to adequately analyze the full range of available sewage sludge management methods, and to determine whether land application is the most beneficial / least harmful means of sewage sludge management. It is irrational and premature to commit to land application without a comprehensive and intensive review of technologies which

could eliminate the need for land application, reduce GHG emissions, and produce electricity, gaseous and solid fuels.

As the WERF (Water Environment Research Federation - sewage plant organization) stated in 2009:

"The energy potential contained in wastewater and biosolids exceeds by ten times the energy used to treat it, and can potentially meet up to 12% of the national electricity demand." SLO County has yet to incorporate this fact into its assessments of sewage sludge management alternatives.

Numerous sewerage agencies are implementing technologies converting sewage sludge into an energy source, reducing the need for cheap disposal through land application (see Supporting Documents below).

It is imperative that SLO County pursue a comprehensive and detailed examination of sewage sludge management methods alternative to land application, given that land application is the only method of disposal both county task forces have been allowed to address, and that land application is the only alternative proposed by the County. SLO County must conduct an analysis regarding technologies such as pyrolysis, gasification, methane capture and electricity production, hydrogen and solid fuel production, etc. There are numerous facilities implementing these technologies. It is imperative that SLO County investigate the infrastructure needs, investment requirements, economics-of-scale practicalities, and joint powers potentials.

**CEQA EIR Alternatives Analysis Inadequate:**

A CEQA EIR analysis of alternatives to the proposed ordinance will only address a narrow set of factors related to ecological impacts. It will not analyze the full range of economic, technological, and infrastructural ramifications of various sewage sludge management alternatives. For this reason, relying on a CEQA/EIR analysis of alternatives would be insufficient in determining the proper and practical path forward. SLO County must invest in examining all methods of sewage sludge management prior to adopting any particular method of disposal.

The County has convened two, year-long, large, multidisciplinary task forces to address this issue (in which CSI participated), but both have been prevented from examining alternatives to sewage sludge land application. It's well past time for the County to embark on an exploration of the technological, environmental, infrastructural and economic ramifications of sewage sludge management techniques alternative to land application. To proceed without such an examination would be tantamount to driving blindly toward unnecessary and

unreasonable environmental and agricultural degradation. It's time to convene a task force devoted to examining alternatives to land application. That would be consistent with County policy set forth since 1998 and 2002.

#### Unsubstantiated Assertion:

The Staff Report asserts (page 3 under "Interim Ordinance") that "Done properly, the use of high quality biosolids in compost has been shown to be a safe and effective way to recycle this natural resource.". SLO County staff has repeatedly made this assertion in previous reports, but has neglected to provide any substantiation supporting it. The BofS should require staff to supply documentation to support this assertion. When previously asked by CSI for substantiation of this assertion, staff has refused to supply it. If evidence exists to support this assertion, CSI would like to examine it and include it in the public record. The BofS should disregard this assertion as unsubstantiated until documentation is provided to support it.

#### Alternatives Analysis Facade:

The Staff Report assertion that an analysis of alternatives to land application has been conducted is false ("Integrated Waste Management Authority Evaluation", page 4). The IWMA manager reports that he gave the IWMA Board a very brief verbal account of his 30-year-old experience on the subject of sewage sludge disposal, which did not include any recent research into the subject. The Staff Report assertion that this represents a current assessment of management alternatives is erroneous. The EHD Director's assertion that this constitutes an adequate analysis of management alternatives is pathetic and insulting. There is no mention of pyrolysis, gasification, methane-produced electricity, hydrogen or solid fuel production, etc. The assertion that the conversion of sewage sludge into a "fuel is prohibitively expensive" is not true, given current technological advancements. The BofS should disregard this purported alternatives analysis as vacuous and without merit.

David Broadwater

Center fo Sludge Information

#### Supporting Documents re: Alternatives to Land Application:

A cursory search for information regarding alternative means of sewage sludge management yields the following results. SLO County has yet to acquire, analyze, and incorporate information like this into its policy formulation. SLO County must do so prior to selecting land application as a preferred method of managing sewage

sludge.

[http://www.bayareabiosolids.com/yahoo\\_site\\_admin/assets/docs/WERF\\_EnergyOpportunities.17093944.pdf](http://www.bayareabiosolids.com/yahoo_site_admin/assets/docs/WERF_EnergyOpportunities.17093944.pdf)

WERF

Energy Opportunities in Wastewater and Biosolids

March 2009

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<http://www.epa.gov/region9/organics/symposium/2010/3-Quinn-PORS.pdf>

US EPA

Bay Area Regional Biosolids to Energy Partnership

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<http://www.bayareabiosolids.com/>

BayAreaBiosolids to Energy

A Regional Approach to Sustainable Energy

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<http://www.cityofpaloalto.org/civicax/filebank/documents/23065/>

Palo Alto

Renewable Energy Resources: Banking on Biosolids

National Association of Clean Water Agencies

...

<http://www.renewableenergyworld.com/rea/news/article/2010/12/managing-biosolids-and-generating-green-energy>

Renewable Energy

Ventura

Managing Biosolids and Generating Green Energy

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<http://www.ncbi.nlm.nih.gov/pubmed/23529399>

US National Library of Medicine

National Institutes of Health

7-20-13

Biosolids management strategies: an evaluation of energy production as an alternative to land application

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It is recommended that energy generation replace land application as the leading biosolids management strategy.

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<http://thinkprogress.org/climate/2011/07/11/264897/sewage-sludge-energy/>

ThinkProgress

7-11-11

The Scoop on Poop: Turning Sewage Sludge into Energy and Dollars

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[http://www.pncwa.org/assets/2012Conf/Presentations/Session\\_20\\_Energy\\_Recovery/winkler\\_gasification\\_sludge\\_biosolids.pdf](http://www.pncwa.org/assets/2012Conf/Presentations/Session_20_Energy_Recovery/winkler_gasification_sludge_biosolids.pdf)

PNCWA

10-24-12

Gasification of Sludge and Biosolids-

A Review of Technology Fundamentals and the Current Commercial Status

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<http://www.nebiosolids.org/uploads/pdf/NE%20Conf.%202010/Alix-Gasificatn-10Nov10.pdf>

Biosolids Gasification - A Technology Review

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[http://www.bayareabiosolids.com/yahoo\\_site\\_admin/assets/docs/RenewableEnergyFocus.118105840.pdf](http://www.bayareabiosolids.com/yahoo_site_admin/assets/docs/RenewableEnergyFocus.118105840.pdf)

Renewable Energy Focus

Biowaste to energy demonstration project gets funding in US

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<http://phys.org/news/2014-02-bioenergy-technology-wastewater-byproducts-hydrogen.html>

Phys.org

2-18-14

Bioenergy technology converts wastewater products to hydrogen

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[http://www.bayareabiosolids.com/yahoo\\_site\\_admin/assets/docs/Press\\_Release\\_MaxWest\\_B2B\\_Selection.10474225.pdf](http://www.bayareabiosolids.com/yahoo_site_admin/assets/docs/Press_Release_MaxWest_B2B_Selection.10474225.pdf)

MaxWest

Max West Systems... BAB2E Project Implementation...

...

<http://www.epa.gov/osw/hazard/wastetypes/wasteid/pdfs/gas-fs.pdf>

US EPA

February 2002

EPA Proposing to Allow Waste as an Energy Source for Synthesis Gas Production and Power Generation

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**CSI: Center for Sludge Information**  
Advocacy through Acquisition, Analysis and Articulation of Information re:  
Land Application of Sewage Sludge  
6604 Portola Rd., Atascadero, Calif. 93422. ph: (805) 466-0352, fx: (805) 462-0408, email:  
csi@thegrid.net

to: SLO County Board of Supervisors

re: **3-12-13 Agenda / Sewage Sludge Land Application – Policy Options**

- Interim Ordinance Extension or Revision with a Permanent Ordinance?
- Staff Recommendation – Option #1: Extend Interim Ordinance Four Years

date: 3-12-13

CSI supports the recommendation of the Health Agency Director, Public Health Administrator and Director of the Environmental Health Division of the Public Health Department included in their Staff Report first dated 1-29-13:

**OPTION 1**

Extend the existing Land Application of Treated Sewage Sludge/Biosolids Interim Ordinance until March 2017.

Extending the current Interim Moratorium sewage sludge land application ordinance, which allows an historical amount of the activity, is more protective of agricultural, economic, environmental and financial viability than the two other options presented in the Staff Report.

This letter will only briefly highlight a few factors substantiating the above.

Should the BofS elect to pursue either other option, CSI is prepared to submit extensive data and recommendations, as it has on this issue since 1998. The processing of Options #2 and #3 (a permanent ordinance subject to a \$250,000 CEQA EIR) would be much more complex, problematic, time-consuming and expensive than extending the IM ordinance. Furthermore, options #2 and #3, making the IM ordinance permanent and processing a newly introduced (1-24-13) permanent ordinance, have serious flaws and would pose potentially negative consequences, significant enough to qualify them for rejection.

SLO County has convened two large multi-disciplinary task forces regarding sewage sludge land application policy. On 3-12-02, the BofS issued its directions for developing a permanent ordinance incorporating the 15 recommendations of the final task force report issued on 10-26-01. The first six of these are the “primary” directions. A one-page list of these directions is attached to this letter for reference.

The IM ordinance is based on **BofS primary direction #5:**

5. The County should establish a limitation on accepting or processing new land application projects for treated sludge beyond historical amounts of EQ treated sewage sludge until completion of the local ordinance to control and regulate land application of treated sludge. (EQ is “exceptional quality” material, as defined in the federal regulations 40 CFR 503.)

Unfortunately, this Staff Report repeats prior negligence of **the BofS primary direction #6** to examine means of sewage sludge management other than land application:

6. In developing an ordinance San Luis Obispo County should consider all feasible methods of treated sewage sludge/biosolids management and their relative impacts.

Technological developments in profitable/remunerative energy production and GHG reduction and utilization as applied to sewage sludge management have been proliferating worldwide for years. Both task forces were prohibited from considering alternatives to land application of sewage sludge as a means of disposal/use, and no organized effort has occurred to fulfill this obligation. Thus, the guidance the BofS receives omits, by design, relevant information about the full range of available policy options. It is imperative for the County to examine alternative means of sewage sludge management prior to adopting any permanent policy, including land application.

## **OPTION 2**

Make the existing... interim ordinance the permanent biosolids ordinance.

The IM ordinance is neither designed to function as permanent policy, nor is it capable of adequately doing so. It lacks the numerous conditions placed on sewage sludge land application projects by all previous and the new draft permanent ordinances - conditions necessary to protect public health, agricultural and environmental viability. A brief comparison of the IM ordinance with the new draft permanent ordinance will demonstrate this.

The IM ordinance does not regulate compost containing sewage sludge, as has every prior and present draft version of the permanent ordinance, a material allowed to be as contaminated as sewage sludge. So, as a permanent ordinance, the IM ordinance would leave SLO County vulnerable to excessive, unregulated and potentially injurious loading of pollutants on its soils.

Finally, the IM ordinance allows land application of sewage sludge containing much higher levels of contaminants than exist in locally generated sewage sludge. A survey of laboratory analyses of sewage sludge generated by two representative local sewage plants over a five-year period demonstrated the degrees to which the so-called "EQ" limits on the ten regulated heavy metals exceed the concentrations found in local sewage sludge. The results of that survey were included in CSI's 1-31-04 comments on the draft permanent ordinance circulated at that time.

The table below shows limits which would allow 91.4% to 94.5% of locally generated sewage sludge to be land applied, and the multiples by which "EQ" limits exceed them. The "EQ" limit for Arsenic (41 ppm) is 7 times higher than the concentration in local sewage sludge (6.3 ppm). The "EQ" heavy-metal limits would allow sewage sludge with 8 times more Cadmium, 15 times more Chromium, 5 times more Copper and Nickel, 2 times more Lead, and 3 times more Mercury, Selenium & Zinc to be land applied.

Potential SLO County Heavy Metal Limits Compared to "EQ" Limits  
(concentrations in mg/kg = ppm)

Calif. & U.S. limits	As	Cd	Cr	Cu	Pb	Hg	Mo	Ni	Se	Zn
503 Table 3 - EQ	41.0	39.0	1200	1500	300	17.0	18	420	36.0	2800
SLO Co. Concentration Mid Range										
91.4 - 94.5% ≤	6.3	4.9	78	950	160	5.8	19	85	12.2	952
<b>EQ limit X SLO Co.</b>	<b>7</b>	<b>8</b>	<b>15</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>3</b>

The use of the USEPA CFR 503 Table 3 "EQ" limits on heavy metals, in addition to allowing excessively contaminated sewage sludge to be spread on lands in the county, fails to comply with **BofS primary directions #1 and #2**:

1. ... Create a local ordinance establishing more stringent requirements for quality of acceptable biosolids material...
2. Local standards for sewage sludge quality shall be derived from but not limited to state and federal regulations.

The use of heavy metal limits identical to "EQ" limits does not establish "more stringent requirements" on sewage sludge contamination, and is contrary to BofS direction not to rely solely on state and federal limits.

**OPTION 3**

Move forward with the draft biosolids ordinance... permanently replacing the existing interim biosolids ordinance.

The new draft permanent ordinance includes a number of elements that comply with BofS direction and provide degrees of protection, which should be included in any future permanent ordinance. Should the BofS select this option, CSI will comment on them at the appropriate time. It also contains a number of significant deficiencies, reformation of which is necessary prior to CEQA and ordinance processing and adoption.

Perhaps the most important are those related to the ultimate, pervasive and long-term effects of sewage sludge land application, i.e., the accumulation of pollutants in soil. This ordinance fails to provide adequate mitigation of those impacts.

It must first be acknowledged that: While sewage sludge is a concentrate of tens of thousands of heavy metals, synthetic and petrochemicals, endocrine disrupting and pharmaceutical compounds, infectious organisms, etc.; Only the accumulation of nine heavy metals in soil is measured and regulated by the new draft permanent ordinance and, identically, by state and federal regulations. This fails to comply with **BofS primary direction #4**:

4. San Luis Obispo County should incorporate into an ordinance a comprehensive set of constituents including heavy metals, synthetic chemicals, pathogens and other pollutants not limited to those in current state and federal standards, for setting sewage sludge quality and land accumulation limits.

It's evident that the IM ordinance and new draft permanent ordinance fail to

expand the scope of regulated pollutants as directed by the BofS, leaving SLO county lands subject to unreasonably unmeasured and unregulated contamination.

**Cumulative Soil Contamination**

The new draft permanent ordinance would allow heavy metal soil concentrations to increase exponentially above background, pre-application levels. The USEPA 40 CFR 503 sewage sludge land application regulations set limits on the amounts of heavy metals allowed to accumulate in soil, in terms of kilograms per hectare. Those limits are included in Table 2 of the 503s. The new draft permanent ordinance, however, sets cumulative limits using Table 3, which applies to heavy metal limits in "EQ" sewage sludge. Communications with the Environmental Health Division have left some confusion and uncertainty as to whether it intends to substitute Table 2 with Table 3, so this letter will address the consequences of both.

The use of either table fails to comply with **BofS primary direction #3**:

3. San Luis Obispo County should adopt a sewage sludge land application ordinance using pollution accumulation limits, considering local soil pollutant levels.

The limits placed on soil accumulation of heavy metals fail to incorporate or reference any information regarding local background soil concentrations of any pollutant. The use of either Table 2 or Table 3 for this purpose would expose local soils to excessive contamination.

Table 2:

As the table below demonstrates, the use of Table 2 limits would permit 57 times more Cadmium, 13 times more Chromium, 27 times more Copper, 7 times more Lead, 32 times more Mercury, 5 times more Nickel, 863 times more Selenium, and 10 times more Zinc to exist in local soils than in average uncontaminated agricultural soils in California. The soil concentration of Cadmium, e.g., would be allowed to increase from 0.36 ppm to 20.36 ppm.

Increases in Heavy Metal Soil Concentrations  
as Multiples of Average California Agricultural Background Levels  
allowed by Table 2  
(soil concs. in mg/kg = ppm)

Heavy Metal	Cd	Cr	Cu	Pb	Hg	Ni	Se	Zn
503 Limit (kg/ha)	39	3000	1500	300	17.0	420	100	2800
503 Limit (lbs/acre)	35	2673	1336	267	15	374	89	2494
Soil Conc. av. (2)	0.36	122	28.7	23.9	0.26	57	0.058	149
Added Soil Conc. *	20.00	1500	750.0	150.0	8.00	210	50.000	1400
Total Soil Conc.	20.36	1622	778.7	173.9	8.26	267	50.058	1549
<b>Multiple Increase</b>	<b>56.6</b>	<b>13.3</b>	<b>27.1</b>	<b>7.3</b>	<b>31.8</b>	<b>4.7</b>	<b>863.1</b>	<b>10.4</b>

\* "Calculated from maximum cumulative pollutant loading limits without taking into account background concentration of the elements in soils." [2] "Resultant soil conc. when the cumulative load limit from Part 503 is mixed into the plow layer. Actual levels would be higher due to background level in soil." [9]

The data for these calculations is derived from the research on uncontaminated

agricultural soil in the state used by the California Department of Food and Agriculture to set pollutant limits for commercial fertilizers (ref. #2).

Table 3:

As written, the new draft permanent ordinance uses 503 Table 3 to set limits on heavy metal soil accumulation:

8.13.040 General Requirements.

...

9. ... Pollutant levels in receiver site soils cannot exceed limits established in the 40 CFR Part 503 Table 3.

While using Table 2 to set these limits would lead to exponential increases in heavy metal soil contamination, using Table 3 would allow even higher concentrations in most cases. As the table below demonstrates, while Cadmium concentration could increase by 57 times under Table 2, it could increase by 108 times under Table 3. The concentration of Copper could be 52 times higher under Table 3, as opposed to 27 times under Table 2. The level of Lead could increase by 13 times, as opposed to 7 times under Table 2. The level of Mercury could increase by 65 times, as compared to 32 times under Table 2.

Increases in Heavy Metal Soil Concentrations  
as Multiples of Average California Agricultural Background Levels  
allowed by Table 3  
(soil concs. in mg/kg = ppm)

Heavy Metal	Cd	Cr	Cu	Pb	Hg	Ni	Se	Zn
503 Limit Table 3	39	1200	1500	300	17	420	36	2800
Soil Conc. av. (2, 9)	0.36	122	28.7	23.9	0.26	57	0.058	149
<b>Multiple Increase</b>	<b>108.3</b>	<b>9.8</b>	<b>52.3</b>	<b>12.6</b>	<b>65.4</b>	<b>7.4</b>	<b>620.7</b>	<b>18.8</b>

Using Table 3 to set soil concentration limits would allow levels of soil contamination to reach the same levels as would be allowed in the sewage sludge, itself. Under this scenario, the soil would become as polluted as the most polluted sewage sludge permitted for land application in SLO County. As such, any movement of this soil from a permitted site to another would necessarily be regulated by this ordinance. The negative ramifications of using this standard could be catastrophic.

Using Table 3 to set heavy metal limits would also violate state and federal laws and regulations regarding sewage sludge land application. Those codes allow local jurisdictions to adopt regulations more restrictive than state and federal regulations, but prohibit adopting less protective regulations.

David Broadwater, Center for Sludge Information

References:

2. "Land application of sewage sludge: scientific perspectives of heavy metal loading limits in Europe & the U.S." S.P. Mc Grath, A.C. Chang, A.L. Page & E. Witter: Soil Science Dep'ts. @ Rothamstead Experimental Station, UK; UC Riverside, Calif; Swedish University of Agricultural Sciences, Sweden. Environmental Review, vol 2, 1994. pgs 108-118.
9. "The Case For Caution: Recommendations for Land Application of Sewage Sludges & an Appraisal of the US EPA's Part 503 Sludge Rules" E.Z. Harrison: Cornell Waste Management Inst., M.B. McBride & D.R. Bouldin: Dep't of Soil, Crop & Atmospheric Sciences, C.U. N.Y. Working Paper 8-97.

## SLO Co. BofS Directions & SSLATF Recommendations List \*

Primary Recommendation = #s 1 – 6.

- \* On 3-12-02 the SLO Co. BofS directed drafting of an ordinance based on San Luis Obispo County Treated Sewage Sludge / Biosolids Land Application Task Force Report & Recommendations to SLO Co. Board of Supervisors, 10-26-01.
1. Identify Option No. 2 as the primary recommendation of the Task Force. [Create a local ordinance establishing more stringent requirements for quality of acceptable biosolids material, as well as local control and oversight of how, when and where biosolids may be applied. A public education campaign as described [above] would be implemented concurrently.]
  2. Local standards for sewage sludge quality shall be derived from but not limited to state and federal regulations.
  3. San Luis Obispo County should adopt a sewage sludge land application ordinance using pollution accumulation limits, considering local soil pollutant levels.
  4. San Luis Obispo County should incorporate into an ordinance a comprehensive set of constituents including heavy metals, synthetic chemicals, pathogens and other pollutants not limited to those in current state and federal standards, for setting sewage sludge quality and land accumulation limits.
  5. The County should establish a limitation on accepting or processing new land application projects for treated sludge beyond historical amounts of EQ treated sewage sludge until completion of the local ordinance to control and regulate land application of treated sludge. (EQ is "exceptional quality" material, as defined in the federal regulations 40 CFR 503.)
  6. In developing an ordinance San Luis Obispo County should consider all feasible methods of treated sewage sludge/biosolids management and their relative impacts.

Notification and Public Information - San Luis Obispo County should incorporate into an ordinance:

7. specific procedures to ensure adequate public & community notification of project proposals, including opportunities to comment regarding them.
8. specific testing, written notification & reporting procedures to ensure consumers receive comprehensive information about treated sewage sludge/biosolids content, source, and usage guidelines.
9. specific procedures for delivering a notification to recipient landowners and users as to the potential problems and benefits associated with the use &/or misuse of treated sewage sludge/biosolids, and for obtaining formal & prior informed consent.
10. specific procedures to ensure property records document any land application activity and the availability of information regarding that activity, so prospective land purchasers and appraisers may be fully informed.

Fees and Financial Considerations - San Luis Obispo County should incorporate into an ordinance:

11. specific procedures to ensure that the fees imposed upon each project are sufficient to fund required assessment, monitoring & oversight activities.
12. provisions for the assessment of fines and/or penalties in case of violations to effectively and rapidly enforce its regulations.
13. requirements for project proponents to post performance bonds & obtain insurance coverage, including pollution liability, to recompense parties potentially impacted by related remediation and/or litigation.
14. General Use and Site Prohibitions - In preparing its ordinance, San Luis Obispo County should consider how, when, where, and whether treated sewage sludge/biosolids should be applied to:
  - a. Human Food-Chain Crops
  - b. Animal Feed Crops
  - c. Grazing, Pasture Land
  - d. Agricultural Soil Classifications
  - e. Home Gardens
  - f. Home Lawns
  - g. Public Parks
  - h. School Playgrounds
  - i. Sports Fields
  - j. Forests
  - k. Sensitive Ecological Areas & Species
15. Program and Project Requirements - In preparing its ordinance, San Luis Obispo County should consider provisions related but not limited to:
  - a. Transportation requirements
  - b. Buffer Zones / Set Back Distances
  - c. Water Supply Protection
  - d. Wind Speed Limits
  - e. Monitoring of heavy metals, pathogens, and other constituents.
  - f. Weather / Season
  - g. Incorporation into Soil
  - h. Runoff Protection
  - i. Erosion Control
  - j. Agronomic Rates
  - k. Crop Limitations
  - l. Type and frequency of application.

Agenda Item No: 21 • Meeting Date: May 6, 2014

Presented By: David Broadwater

Rec'd prior to the meeting & posted on: May 1, 2014

