

LOCAL APPLICATION OF WASTEWATER SLUDGE IN GRANADA PROVINCE WITH THE TECHNICAL ASSISTANCE OF THE GRANADA PROVINCE COUNCIL

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ABSTRACT

In the coming years and as a result of the implementation of regulations on wastewater treatment, almost all municipalities in the province of Granada have a treatment system in operation, leading to increased production of sludge from wastewater treatment plants.

The Comprehensive National Plan for Waste (PNIR) includes agricultural application of sludge as the main destination, as well as monitoring and control in agricultural use and the minimization of transportation of them.

In the municipalities of the province, holders of competition in purification and waste management, and therefore responsible for the management of sludge, these will generate an additional problem as there are no technical or economic means to manage (88% the municipalities of the province have less than 2,000 inhabitants) The Granada Province Council, to remedy this situation, has initiated actions to lay the foundations of the Management Plan of Waster Water Treatment Plant sludge. Among the measurements is technical assistance to local agricultural application of sludge by the same management in the municipality where they are generated, and applying the principles contained in the Comprehensive National Plan for Waste (PNIR).

This allows municipalities of the province comply with the provisions of the legislation in force, with a low cost of sludge management, and the Granada Province Council set new goals to take precedence over the requirements that will require future in the application of sludge to soils.

Keywords: sludge, management, soil, cost.

Introduction

The sewage sludge regulations are very strict, and is expected to become more challenging given the high environmental impact they have. In this way, management is one of the biggest problems they face to the municipalities as owners of competition in purification of urban wastewater.

The PNIR establishing the agricultural use of WWTP sludge as one of the main ways of valuing them. From what is stated in the law 7 / 2007 Integrated Management of Environmental Quality in Andalusia, in the category of waste, it is clear that municipalities as managers can manage MSW treatment plant sludge to be treated as such urban solid waste as stated in the law of waste 10/98.

The Granada Province Council, through its program of Agreement Municipal Granada in Network offer the Maintenance and Preservation Program of Waste Water Treatments Plants, which is made from technical advice on the operation, maintenance and conservation. In the program includes technical advice on the management of sludge from the treatment and especially in subsequent agricultural use.

Methods

Since 2006 the Waste Water Treatment Plants operating under the Maintenance and Preservation program are being made analytical characterization of sludge produced. In principle, this characterization was performed to estimate if the sludge from sewage treatment plants under the program had heavy metal levels below what the legislation provided for agricultural application. To perform this characterization, and as the laboratory environment of the Granada Province Council had not installed the analytical techniques needed to carry out an independent laboratory was contracted accredited ISO 17025.

In this first characterization is concluded that the levels of heavy metals in sludge from the sewage treatment plants were well below the limits set out in RD 1310/1990 agricultural application of sludge from wastewater treatment plants.

Having established that could make the agricultural application of sludge shall be established a local management program of the same direction from the Department of the Environment. This program consists of six phases, which are designed and implemented by the staff of the Department.

- Phase 1: touchdown with farmers in the area where sludge is generated, which are looking for agricultural parcels, mainly olive and almond trees, which are not abandoned.
- Phase 2 or in carrying out the analytical characterization of sludge, which is necessary is to give the outside laboratory hired for this purpose a list of the WWTPs sampled with the point specified sampling (output dewatering system was to collect, anaerobic digestion compartment of the compact or bottom of the anaerobic lagoon) as the sludge line of each WWTP. Once analytical results are validated by the laboratory, a report issued by the laboratory analytical characterization of sludge. This characterization is being carried out so far for the parameters listed in RD 1310/1990, and from this year will determine VOC to determine their environmental impact in the agricultural application.
- Phase 3 or sampling and analytical characterization of the agricultural parcel or location of application of sludge. Before sampling is carried out a feasibility study with field data prior to the application of sludge. If the application is feasible is applicable to soil sampling and analytical characterization by accredited laboratory.
- Phase 4 or implementation report. Writing a report on the application of sludge comprising the following sections:

1. introduction: referred to the background in which falls the report.
2. Objective , which states the purpose of the report which is the local management of WWTP sludge.
3. Description of the Waste Water Treatment Plant.
4. General criteria assessment for the use of sludge from wastewater treatment plants, which generally includes the basic rules to follow in making environmentally sound application of sludge.
5. Presentation agricultural area.
6. Description of the plot for the application of sludge (the plot castrate reference, surface and preferential cultivation of the land and area of each crop).
7. analytical characterization results. This section contains the analytical characterization of sludge and soil in accordance with Royal Decree 1310/1990.
8. Maximum amount of sludge that can be applied in the agricultural plot. This section includes the following sections:

Fertilizer value of sludge from wastewater treatment plants. depending on the type of crops grown on the plot, calculate the maximum amount of nitrogen from sewage treatment plant sludge that can take the crop getting the first criterion limiting the application of sludge to crop.

Annual amount of heavy metals that can take the field. With the composition of heavy metals and considering the annual limit values applying them listed in RD 1310/1990 is estimated the maximum amount of sludge that can be applied in the plot, with the latter criterion limiting.

Implementation plan, according to the limiting criteria, establishing maximum amount to apply, timing in the implementation and recommendations for implementation.

Good practice in the application of sludge based on the code of good agricultural practices of the Ministry of Agriculture and Fisheries of the Junta de Andalucía, where in paragraph "4. Recommendations "includes the agricultural use of WWTP sludge.

9. conclusions carry over whether or not the application of sludge in the plot, and the recommendation of compliance with regulations.
10. annex, the report is completed with all necessary documentation to comply with the regulations.

-Phase 5 or monitoring of the implementation plan of sludge. In this phase, follow-up visits to the plots where sludge is being applied, it is checked if they are following the guidelines outlined in the report of agricultural application of sludge. With the information obtained by drawing up a monitoring report on the application of sludge in establishing whether their application is being correctly and following the guidelines established or not, referring to the actions which must be changed to comply with current legislation.

- Phase 6: Determine **the best agricultural soils**. Following the application of sludge is performed analytical characterization of the soil where sludge is being applied to check the agronomic improvement of these soils have suffered.

Results and discussion

Every year since 2006, is performed to characterize the sludge from 22 sewage treatment plants operating under the Maintenance and Preservation Program, with different treatment systems. Of these characterizations is the following conclusions:

- heavy metal content of sludge from sewage treatment plants are characterized well below the limit values set out in RD 1310/1990 and are therefore suitable for agricultural application.
- Similarly, compare the amount of nutrients that are provided, determining that there is a difference in the contribution of nitrogen when applied sludge from anaerobic digestion to when we see the same contents in undigested sludge, such as scarification of the peat beds.

With all these results, we see that the local application program WWTP sludge in addition to controlling the process, improves soil by providing nutrients.

Since the program already has a running time we must ask not only the characterization of heavy metals, but as informative as the determination of other contaminants limits prefacing the new management of sludge (still under study) and existing drafts can be established.

Conclusion

The compliance of application of sludge from wastewater treatment plants in agriculture needs a thorough survey of the entire process. Municipalities as owners of the WWTP are required to manage, though technical and financial resources of those who have are minimal. The local application in agriculture reduces the costs of sludge management and the biggest cost is the derivative of transport is reduced when making a local application using the same means of transport available to the council and used for means of implementation available to the farmer. The costs are limited to the analytical characterization of sludge and soils and technical support from the Granada Province Council is offered.