



Sound provision for industrial noise now and in the future

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Summary

In the Netherlands, the environmental noise from companies on collective industrial estate with a noise zone around is assessed cumulatively. In the assessment it is not allowed to take into account provisions for empty lots, or for companies with relatively low permitted noise production. This makes the management of the cumulative sound and of requested provisions a difficult issue. It often happens that there are still issuable premises, with insufficient noise production allocated to them.

In the Netherlands, we intend to find a solution to this in different ways. Anticipating a change in legislation in 2018 (the Environment Act), a noise distribution plan may be fixed in the zoning. Thus, the available sound space can still be managed and reserved sound space can be secured.

This paper explains how this can be done. It also presents suggestions for improvement for the future regulation of industrial noise in the Environment Act, compared to the existing plans for this. There are rightly considerable complaints about the current regulation for industrial noise, even though it has proven to be for the good of the country. In its present form however it is not a good example for other countries, but after a thorough revision it might be!

1. Introduction

In the Netherlands, the noise emitted by companies on many industrial estates is assessed cumulatively, i.e. the contributions of all companies are added energetically. This applies to certain industrial estates where companies are to be settled that may cause significant noise levels around the industrial estate. Under the Noise Abatement Act a noise zone is established around such an industrial estate. Outside this noise zone, the noise should not exceed 50 dB (A). For noise-sensitive premises within the zone, a higher legal limit of up to 65 dB (A) applies. Such a level is only allowable if the interior limit is respected thanks to measures at the façade. If a legal limit value is being exceeded, an application for an environmental permit must be refused unless the requested permit leads to a situation where the excess no longer exists. The latter is troublesome, because the excess is usually caused by the accumulation of a multitude of sources from different companies. Incidentally, the mandatory ground for refusal lapses whenever a so-called noise reduction plan has been established by the competent authority that

will lead to compliance with the limit values within a period of maximum 5 years.

The preparation of a noise reduction plan is required from the moment the limits are actually being exceeded. This situation may mean that in the industrial estate there are still issuable lots, but there is no sound-space available for those sites. With an area management plan, the competent authority can monitor the distribution of the sound space. The court takes the view that the Noise Abatement Act does not allow the establishment, within the zone management plan, of a maximum permissible sound space per lot, leading to a refusal of the environmental permit in the case of an excess of this permissible sound space. Indeed, this would allow one company holding a license to use up all reserved sound spaces of the unissued lots. Obviously, this is an undesirable situation.

2. Spatial rules

There is a way to deal with this deficiency in the law, namely by applying another law than the Noise Abatement Act: the Spatial Planning Act. According to this law, a spatial plan exists for the industrial estate. That plan determines which buildings and what uses are permitted within the plan under concern and under what conditions. These must be conditions with spatial relevance. The balanced distribution of the available noise space amongst different plots of the industrial estate is a spatial interest. After all, in this manner, it can be secured that for all lots there will be sufficient remaining sound space available, so all of these plots can be used for their intended purpose.

But how can this be done effectively? In many zone management plans a particular emission is defined in $dB (A)/m^2$. However, exceeding this emission does not always mean that too much sound space is used and too high levels are produced on the control points within the noise zone and on the zone's boundary. Moreover, the differences in sound space in different directions may not be taken into account. Especially in the smaller industrial estates in the Netherlands, of which there are many, this can lead to an unbalanced, ineffective control. Capturing the sound capacity per lot on the control points within the noise zone and the noise zone's boundary, so at noise immission or noise reception level, has as much room for differentiation and customization, thus making it better and more effective. The basis for this sound space is a fixed indicator in dB (A)/ m^2 matching the location of the lot. For example, 75 dB (A)/m² (diurnal value) for plots in the centre of the industrial estate and 55 dB (A)/ m^2 for plots on the edge of the industrial estate with residential buildings in the vicinity. If necessary for certain control points where there is relatively little noise space, the allowed contribution may be reduced down to the permitted noise level if this is lower. Alternatively it could be raised if the permitted noise level is higher. This adjustment can be different per control point and per time period (day, evening or night) in a twenty-four hours diurnal day. This differentiation is not possible when using emission indicators. The disadvantage of this method is that when merging or splitting the plots they usually must be re-calculated. This disadvantage can be overcome with an environmental permit for an alleged deviation within the plan. This is a relatively light licensing procedure.

When using an immission level per lot, how does this test work? The allowed immission per lot is stored in a table, with its indicator value and an immission (reception) value per 24-hour period.

An excess of this allowed immission leads to a conflicting application of the rules of the zoning-plan.

For this adverse use an environmental permit is needed and this may either be granted subject to conditions, or may be refused. In the latter case, the requested extension cannot take place due to an expected conflict with the zoning plan. If the deviation is limited and the zone management plan for the corresponding points has sufficient provisional sound space, the requested derogation is permitted, so that the requested extension may indeed continue.

Especially for large industrial estates with many plots still to be issued it is advisable to associate the zone management plan to the zoning plan, and not to wait for legislation that possibly allows it to be done in a perhaps simpler way.

3. Future legislation

In 2018 the Environment Act will come into force. Through the Crisis and Recovery Act it is already possible to anticipate this legal revision for designated areas, treating them underl under the new Environmental Law, and also it is possible to deviate in other ways the current laws and regulations. The latest, for example, by using the zone management plan even without the previously described coupling to the zoning plan, i.e. by referring to the zoning as a reference for the environmental permit. As already mentioned, this can only be done for designated areas, not in general terms.

Summarizing: municipalities can choose one of the following options:

- 1. The zoning scheme for adjusting the sites of the industrial estate in the manner described above.
- 2. Register the industrial areas as a development area within the meaning of the Crisis- and Recovery Law, under which, in addition to the limits of the Noise Abatement Act the area management plan may serve as a control basis for authorization.
- 3. Do nothing, and in anticipation of the Environment Act in 2018 hope that the available noise space turns out to be sufficient for the plots of the industrial estate still to be issued.

That last option is perhaps not that bad, since the laws and regulations for industrial noise with the Environment Act may be turned around completely.

To date it is still unknown how exactly the new legal scheme will work out. Some basic ideas on this issue are already known, and below some of them are considered in more detail. This is however with the proviso that in the Environment Act it will probably all work out very differently.

New dose measure Lden

Currently, for industrial noise, the indicator is still the "diurnal day level", which is defined as the <u>maximum</u> of three levels:

- Lday
- Levening + 5 dB
- Lnight + 10 dB

It is expected that the indicator will be changed to the European harmonised indicator for environmental noise, Lden. Possibly with additional limits for Lnight. For reasons of simplicity, the former Ldiurnal of 50 dB(A) is translated into an Lday of 50 dB and an Lnight of 40 dB.

The current indicator Ldiurnal refers to the accumulation of all licensed contributions based on the so-called RBS, the "representative operating condition". This is the condition which relates to the maximum amount of noise which the plant could produce within its licence to operate. Exceptional conditions (i.e. less than 12 times per year) should not be included. The interpretation of Lden however is such that it represents the annual average operating conditions for all companies. Obviously, this will be lower than Ldiurnal on the basis of the RBS. A neutral effect transformation, which is aimed for, should result in smaller contours and monitoring points at a shorter distance from the industrial area. One is still looking for a way there (an algorithm) to make this conversion in an unambiguous and simple way.

In the author's view, this approach would not be consistent.

On the one hand it is stated that the limit of 50 dB Ldiurnal is "equivalent" to 50 dB Lden, but by also arguing that this should not lead to more noise space for industry (effect neutral) it is at least suggested that the new standard leads to more noise (annoyance). In my opinion the latter is not the case. Industrial noise of zoned industrial estates in the Netherlands only has a minor effect on overall annoyance.

Most of the "nuisance" is encountered during the paperwork of all the licensed and permitted sound spaces within the limits. Usually broadening the noise zone is politically and socially not easy, even if it will have hardly an audible effect in practice. Therefore it is positive that for the conversion to an annual average standard (instead of using the RBS) a limited amount of additional sound space will be there without requiring that the limit should be raised. The algorithm which is searched for can be found in its simplest form: one to one transfer of current standards in Ldiurnal to equal standards Lden. Likewise for the night period to Lnight.

Not relevant contributions

All licensed sound space is accumulated, even if it concers not acoustically relevant companies which barely use the licensed sound space. It is suggested to disregard the sound space of this kind of companies in the new system. In my view it is correct not to include into the zone management model all companies with their full licensed sound space. Even now, in many models this does not happen. For example, many business centers, are being modeled with a single point source, which by no means represents all licensed sound space.

Another way is to start from a minimum reserved noise space, converted to a given source strength in dB $/m^2$. In my opinion this latter method deserves to be preferable, also in the new system. If not acoustically relevant companies are ignored, i.e. no noise provision is allocated to the particular site, there is a serious risk that there will be no noise space available for new comers in case a non relevant company leaves and a more relevant company wants to settle on this site. Another way is a distribution of the entire estate into a lighter area, for example a business park for light acoustically less relevant companies and, on the other hand, the actual industrial park, designed for heavier acoustically relevant companies. The relatively heavy instrument of sound management zone is then used for the companies for which it is actually intended.

4. Conclusions

Industrial noise of zoned industrial land is so well regulated in the Netherlands, that environmental disturbance due to such sites is relatively limited. Yet the legal system does still carry the necessary drawbacks, making it not yet to be recommended to other countries. For example it is not really possible to take into account the reserved sound space for the available sites not yet in use. Therefore it is possible that there are still issuable sites available, but there is no remaining sound space. By linking the zone management model to the zoning plan this could be overcome.

For many industrial estates in The Netherlands a scheme based on immission (reception) levels per lot is preferable over an arrangement based on the emission level in dB (A)/ m^2 .

Especially for industrial sites with a large amount of issuable grounds it is advisable to link the zone management plan to the land use plan, and not to wait for legislation that allows this in perhaps a simpler way. For other industrial terrains that last option may not be so bad, since the laws and regulations for industrial noise may be turned around completely when the Environment Act 2018 will enter into force. A couple of possible changes have been considered.

The widening of a noise zone is politically and socially not always easy, even if in practice it will hardly have an audible effect and the nuisance will be relatively limited. That, by converting to an annual average standard, a limited amount of extra sound space will be created without the need to raise the limit is therefore a good thing. The proposed algorithm for the conversion of the control points from Ldiurnal to Lden therefore may not have the neutral effect, as it is intended.

It is suggested to leave the acoustic space of not relevant companies out of consideration in the new system. A better alternative is to start from a minimum reserved noise space, converted into a given source strength in dB $/m^2$, to keep sound space available for further possibly acoustically more relevant companies to be established at those lands.

Another method is a division on the one hand into a business park for light, acoustically less relevant companies and, on the other hand into the actual industrial area for the acoustically relevant companies. The relatively heavy instrument of noise zone management is then used for the companies for which it was actually meant. EuroNoise 2015 31 May - 3 June, Maastricht