



Le 18 juillet 2014

Madame Tania Tzakova
STABLEX CANADA INC.
760, boulevard Industriel
Blainville (Québec) J7C 3V4

Objet : Revue bibliographique, volet 2
Transmission des résultats (2) - Dossier CRIQ n° 640-PX48719

Madame,

À la suite des travaux que nous avons réalisés et conformément aux dispositions de notre mandat, c'est avec plaisir que nous vous transmettons les résultats de la revue bibliographique du volet 2 pour répondre à la question : « Voir s'il y a d'autres compagnies dans le monde qui font du Stalex et, si oui, ont-elles des problèmes d'odeur? ».

Ce présent rapport fait suite à celui de la revue bibliographique, volet 1 (dossier CRIQ n° 640-PX48719) envoyé le 17 juillet dernier à **STABLEX CANADA INC.**

La méthodologie de recherche telle que brièvement décrite ci-après a été utilisée.

MÉTHODOLOGIE DE RECHERCHE

Plusieurs requêtes bibliographiques thématiques ont été développées et exécutées sur 97 bases de données. Après quelques essais, les concepts de recherche suivants ont été retenus et utilisés sur le Web et sur l'outil de recherche Proquest Dialog :

1. Le procédé, Stalex, Seal-o-safe
2. Le concept des odeurs et ses synonymes
3. Le concept des lieux dont, Mexico, Australia, Japon, Nagoya, Tokyo

Ces concepts ont été jumelés de différentes façons afin d'en arriver à une liste de résultats ayant un potentiel d'intérêt. Il est pertinent d'ajouter ici, qu'utilisé seul, le concept Stalex réduit le nombre de résultats à quelques centaines seulement.

Des recherches ont également été faites en remplaçant le concept Stalex par d'autres expliquant le procédé. Les résultats n'ont cependant pas été concluants.

Les différentes recherches effectuées ont mené à quelques centaines de résultats. Parmi eux, seulement douze références ont été retenues jusqu'à présent. Ces références ont été listées à l'annexe A. Comme plusieurs de ces documents sont généraux, le numéro de page où se situe l'information pertinente a été indiqué à côté de chacune de ces références. Les résumés ou les extraits des références n^{os} 1 à 8 se retrouvent à l'annexe B.

En plus de ces douze références, cette recherche a aussi permis d'identifier cinq brevets faisant intervenir la stabilisation des déchets. Les références de ces brevets sont listées à l'annexe C. Elles ont été conservées à titre informatif et pour consultation ultérieure.

De plus, deux références moins pertinentes au volet 2, mais ayant tout de même un intérêt pour la problématique générale de **STABLEX CANADA INC.** sont présentées à l'annexe D.

Référence n° 13 - Pour la première, il est notamment question d'une étude sur la présence de l'ammoniac dans plusieurs F/A (cendres volantes) depuis 1990 et de son impact sur la libération de l'ammoniac lors de l'hydratation du mélange cimentaire et de son durcissement.

Référence n° 14 - Pour la seconde, il est question d'un procédé de fabrication des amines à partir de l'hydrogénation des amides impliquant de l'hydrogène libre. Étant donné que l'on nous a informés qu'il y a du polyacrylamide et un peu d'hydrogène dans le procédé utilisé par **STABLEX CANADA INC.**, il a été décidé de conserver cette référence dans ce présent rapport.

RÉSULTATS

De ces douze références retenues (annexe A), quatre sont des articles généraux sur la stabilisation des déchets par le ciment (9 à 12). Elles ont été conservées dans ce rapport à titre de sources d'information générale pour consultation ultérieure lors de la résolution de la problématique d'odeur.

Trois références font état de l'historique d'industries utilisant un procédé Seal-o-safe, de leur emplacement ou d'une problématique de lixiviation des métaux (6 à 8).

Cinq références seulement mentionnent une problématique d'odeur (1 à 5).

RÉSUMÉ DES RÉFÉRENCES

Les références n^{os} 1 à 5 résumées ci-après détaillent ces dernières problématiques liées aux odeurs

La référence n° 1 mentionne la demande de permis pour l'installation d'un procédé Seal-o-safe par Stablex au Michigan, en 1982. Le permis a été refusé à cause d'une problématique de qualité de l'argile, de la proximité d'un lac, du trafic écolier important face à celui des éventuels camions de déchets et d'une possible problématique d'odeur.

La **référence n° 2** porte sur une pétition de 1 800 noms faite contre les opérations de la compagnie Leigh à Walsall, Angleterre, en 1988. Un procédé Seal-O-safe était utilisé pour couler le ciment dans un ancien puits de mine. Il est mentionné notamment que le puits de mine émettait de très fortes odeurs, mais la référence aux odeurs s'arrête là. La compagnie a fait face à plusieurs poursuites face aux craintes des citoyens en regard de leur santé.

La **référence n° 3** porte sur l'installation de Stablex à West Thurrock, Angleterre, dans une mine d'argile abandonnée. La lixiviation semblait être le cœur du problème. Le lien avec les odeurs n'était seulement que pour des barils percés contenant des déchets poudreux.

La **référence n° 4** fait suite à la référence n° 2, laquelle mentionne que les citoyens ont gagné une bataille contre les installations de Leigh à Walsall. Leur procédé Seal-o-safe générerait une poudre odorante plutôt qu'un bloc de ciment.

Finalement, la **référence n° 5** est aussi relative à la référence n° 2. Une possible implantation d'un site de traitement des déchets voulant employer notamment, un procédé Stablex au New Hampshire a été défaite par l'opposition des citoyens qui faisaient référence aux problèmes rencontrés en Angleterre, notamment celui du problème d'odeur.

En résumé, dans tous ces articles, bien que le problème d'odeur associé au procédé Seal-o-safe ait été mentionné, on n'apprend rien quant aux solutions apportées. De plus, la problématique semblait plutôt liée à la mauvaise utilisation du procédé et à des problèmes de lixiviation.

Les références n° 6 à 8 résumées ci-après détaillent ces dernières problématiques non liées aux odeurs

Une étude indépendante réalisée en 1981 en collaboration avec Stablex limited sur le site de West Thurrock, Angleterre, mentionne diverses conclusions et recommandations relativement à certains problèmes de lixiviation, mais ne traitent pas de problèmes d'odeur. Ils mentionnent aussi que les problèmes de lixiviation à Thurrock n'étaient pas présents dans les installations de **STABLEX CANADA INC.** notamment à Blainville, Québec. Dans l'installation de Blainville, un procédé de destruction des contaminants avait été incorporé au procédé Stablex (**référence n° 6**).

La **référence n° 7** fait état de la pratique de la stabilisation par solidification des déchets et du procédé Seal-o-safe. Elle fait mention de la fermeture, dans les années 90, de l'installation de West Thurrock, Angleterre, opérée par Cory Environmental. La cause étant la forte compétition avec les sites d'enfouissement direct sans traitement. Il est fait également mention des installations de Leigh Environmental opérées à Brownhills dans les années 80 où quelques incidents de lixiviation avaient été rapportés. Leigh a donc perdu sa licence d'exploitation du procédé Seal-o-safe en 1989. La trop forte concentration de matière organique était vraisemblablement la cause de ces lixiviations.

La **référence n° 8** rapporte les mêmes faits que la référence n° 7 concernant les installations des compagnies Cory Environmental et Leigh Environmental en Angleterre.

La référence n° 7 mentionne aussi plusieurs pays dans lesquels le procédé Seal-o-safe a été implanté :

- Nagoya et Tokyo au Japon en 1977
- Amérique du Nord en 1977
- Australie
- Europe

Elle mentionne particulièrement l'installation de Blainville, Québec, implantée en 1983 qui est considérée comme une usine hautement efficace (*highly effective*) pour le traitement des déchets inorganiques.

CONCLUSION

La recherche bibliographique du volet 2 a permis de trouver plusieurs installations dans le monde utilisant le procédé Seal-o-safe, et ce, depuis 1976, dont quelques-unes sont maintenant fermées. Bien que certaines références mentionnent des problèmes d'odeur, aucune ne donne d'information pertinente à ce sujet. La problématique la plus mentionnée est celle de la lixiviation dans certaines installations en Angleterre.

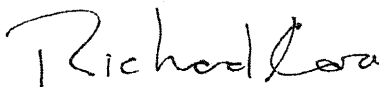
Dans ces références, l'installation de Blainville a été mentionnée deux fois et c'était à titre de bon exemple de fonctionnement.

Cette revue bibliographique a aussi permis de trouver des documents de références (n°s 9 à 14) ainsi que quelques brevets qui pourront être utiles pour la suite de la résolution de la problématique d'odeur.

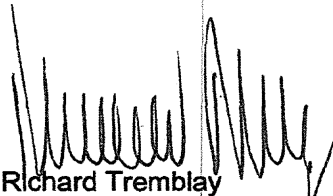
Les résultats consignés dans ce rapport ne font référence qu'aux produits qui y sont décrits.

Nous espérons le tout à votre entière satisfaction et vous invitons à communiquer avec monsieur Yves Guérin, conseiller industriel au CRIQ, pour tout renseignement complémentaire.

Recevez, Madame, nos salutations distinguées.



Richard François Caron, ing., chim., M. Sc. A.
Responsable technique



Richard Tremblay
Vice-président, Opérations

p. j. Annexes

c.c. M. Yves Guérin

ANNEXE A

Listes des douze références conservées

Volet 2 : sur l'existence de d'autres installations utilisant le procédé Stablex et
ayant une problématique d'odeur

Annexe A : Liste des douze références (avec lien hypertexte)

Avec problématique d'odeur

- 1- Environmental Justice and Hazardous Waste: A View from the Canada-United States Border Voir p. 174-176 (Michigan)
- 2- European Foundation for the Improvement of Living and Working Conditions Voir p. 42-43 (hypertexte)
- 3- Safety Issue Raised on N. H. Waste Plan, first edition, Pokorny, Brad. Boston Globe [Boston Mass]; 4 pages (.doc)
- 4- Never-ending war of Stubber's Green A group of Walsall residents have won a legal battle against the giant Leigh Interests toxic disposal company. It is a significant victory in a long war against the huge waste site on their doorstep; Holderness, Mike. The Guardian [Manchester (UK)] 6 nov 1992; 3 pages (.doc)
- 5- Warren and the Waste Site Fight; Town Distrustful; It Corp. Blames Not-In-My-Yard' Attitude; first edition, Andrew Blake, Globe Staff. Boston Globe [Boston Mass]; 1 Aug 1982; 6 pages (.doc)

Sans problématique d'odeur

- 6- Investigation of Stablex Material Emplaced at West Thurrock Facility, England – Draft Report Voir p. IV et p. 10 à 12 (hypertexte)
- 7- State Of Practice Report Uk Stabilisation/Solidification Treatment And Remediation: Binders & Technologies – Part III Applications Voir p.6-8 (hypertexte)
- 8- Hazardous Waste Management Market Pressures and Opportunities: Background Paper Voir p. 77-79 (hypertexte)

Pour référence ultérieure

- 9- Waste solidification/stabilization technology : literature review / (1984) Voir p.22-23 (hypertexte)
- 10- Cement-based Stabilization of Wastes: Practical and Theoretical Considerations (hypertexte)
- 11- The Scientific Management of Hazardous Wastes Voir p. 407 à 427 (hypertexte)
- 12- Some independent assessments of the SEALOSAFE/STABLEX method for toxic waste treatment (hypertexte)

ANNEXE B

Résumé ou extrait des références n^{os} 1 à 8
Volet 2 : sur l'existence de d'autres installations utilisant le procédé Stablex et
ayant une problématique d'odeur

Extrait de la référence n° 1
Environmental Justice and Hazardous Waste: A View from the Canada-United States Border, voir p. 174-176 (Michigan)

The most positive reaction came from the Oakland County Health Division which supported the proposal as a way of dealing with the problem of "hazardous waste materials which are indiscriminately entering [waste water treatment facilities] via sewers, landfills and illicit dumpings" (SRB October 1982).

In December 1982, SRB issued a seven to one decision to deny the permit. All four of the local members voted against the facility as did three of the four permanent members. The decision was not based on direct evidence that the facility would be unable to comply with Act 64 or otherwise pose an unreasonable risk to the community or the environment, as occurred in the EMS verdict. Rather, SRB found that ERES had failed to submit a satisfactory analysis of risk related to transportation, ground and surface water contamination, fires and explosions, and overall environmental impact. In addition, the board concluded that ERES had "failed to provide adequate information to indicate that it possesses the level of technical and managerial expertise needed to safely operate a facility of the size and complexity being proposed" (SRB December 1982).

5.3.3 Stablex Corporation

The SRB first met to review the Stablex facility siting proposal in December 1982. The applicant was seeking approval to build a landfill and stabilization/treatment facility in the suburban Oakland County community of Groveland Township to the north of Pontiac, Michigan. According to the 1990 U.S. Census, Groveland Township has a mostly white (97.1 percent) population of 4,705 and a higher than average median household income of \$48,288 as compared to the State of Michigan generally. Stablex was proposing to convert a 200 acre mining quarry site into a landfill and treatment

facility. The first stage of the project would have involved a 50 acre landfill, but the applicant's long-term plan was for up to a 184 acre landfill.

The proposal was particularly controversial because it would not have included a synthetic liner which Stablex argued would be unnecessary given its patented process of solidification. The "sealose" solidification process used calcium aluminosilicate (typically flyash from coal plants) and cement mixed with chemically pre-treated hazardous wastes. The British company had developed and applied the process at landfills in England and later at a facility in the Montreal area. The proposal was not new to area residents since the company had originally sought approval for the facility in 1978 when U.S. EPA issued Stablex a regulatory waiver from the usual requirement for synthetic liners in all hazardous waste landfills. Because the case was first proposed before the 1979 passage of Act 64, it was initially handled as a civil proceeding and went through a variety of appeals. In May 1981, the Michigan Court of Appeals denied Stablex's request for a construction permit and ordered an SRB review.

During public hearings before SRB from December 1982 to October 1983, local government officials and residents of Groveland Township expressed numerous concerns about the Stablex facility. Town officials took issue with the landfill's incompatibility with site's existing E1 (extraction) zoning, the population density in a three square mile vicinity (4,136 persons per square mile), a lack of hydrogeological assessments, a lack of emergency planning, and the "untested" nature of the "sealose" process (at least within the U.S.). A number of area residents spoke to each of these concerns as well as to the problem of odors and the potential for accidents between waste haulers and school buses.

Many of the complaints implied a lack of trust in the company, particularly given its previous attempts to avoid the SRB process and the various competing appeals between the company and the Township that had ensued.

In September 1983, SRB took a preliminary poll of members and denied the construction permit by a six to three vote. Each of the four local members voted for denial as did two of the five permanent members. The decision was based on incompatible hydrogeology (the site was on top of an aquifer with no natural barrier), a conflict with local zoning, a potential harm to local recreation in nearby streams and lakes, insufficient engineering plans, and a lack of proof that the "sealosafe" technology is safe without a synthetic liner. The decision was adopted in October 1983 by a five to two vote (one local member and one permanent member were not present).

5.3.4 National Chemical Services (NCS)

SRB hearings on a National Chemical Services (NCS) proposal for a hazardous waste treatment facility in the City of Detroit began in December 1987. Detroit's population is 1,027,974 and 75.6 percent black, 21.6 percent white and 2.8 other according to the 1990 U.S. Census. Its median household income (\$18,742) is much lower than the Michigan state-wide average (\$31,020). The facility was proposed for siting in the highly industrial southwestern part of the city in the neighborhood of Delray. The area has a population of 3,941 and is 61 percent white, 29 percent black and 10 percent other, according to the 1990 U.S. Census. The City of Detroit's Master Plan addresses this aspect of Delray's environment in terms of a long-standing dilemma

Extrait de la **référence n° 2**
European Foundation for the Improvement of Living and Working Conditions,
voir p. 42-43 (hypertexte)

One local MSF branch in an area with toxic waste incineration operations says "the practice of incinerating large amounts of toxic cocktails" should be ended, and that "the method of toxic waste disposal should be reached democratically, fully taking into account the views of the waste disposal authorities and the local population".

At least one incinerator has been closed down, that operated by a company called Rechem in Bonnybridge in Scotland. There was massive opposition to the plant from the local community and findings of research carried out into the health effects on local people including a high incidence of twinning in the area. Although the Rechem workforce was unionised, local unions supported the closure of the plant in this instance.

The waste disposal industry claims that new legislation in the form of new partly enacted Environmental Protection Act and forthcoming European directives will force higher standards on the industry. But Greenpeace criticises the lack of enforcement officers to ensure that legislation is complied with.

In summary, waste disposal companies and their financiers argue that the process is safe and environmentally friendly in that it disposes of dangerous toxic waste; whilst unions and green groups, local communities, local authorities and food manufacturers argue that the safety of the process has not been proved, and that research and development in clean production methods is necessary.

Disposal of toxic waste - Case Study

A "Report on the controversy surrounding Leigh Environmental Services" (Part of Leigh Interests) was prepared for Greenpeace in 1988. The following outline is taken from this report, and is an example of a conflictual relationship between a waste disposal company and the community. (It is worth noting that this Case Study was used by NALGO in their Environmental Training Course Handbook: "Greenprint for Action" published in 1990.)

Leigh's operations in Walsall, in the West Midlands area of England uses a process called "Sealosafe" which involves solidifying waste after it has been pumped into mineshafts. Residents in the area formed a group, Community Action against Toxic waste. The aim of the campaign is to drive Leigh out of Walsall.

Initial complaints began in the late 1960's as a result of foul smells emanating from mineshafts where chemicals and other waste products were being dumped. The situation continued for several years and worsened with incidents including one in May 1987, when the area was enveloped in a dense gas and school children were sent home suffering from stomach upsets.

1,800 local people signed a petition against the company and complained of headaches, migraines, nausea, vomiting, stomach upsets, diarrhoea, asthma, bronchitis, allergic complaints and miscarriage (1 in 5 pregnancies in the area ends in miscarriage).

The petition and symptoms was sent to the local authority for investigation of Leigh's operations. The matter was also referred to the Secretary of State for the Environment. The residents group also carried out a survey and found high incidence of cancer and leukaemia. A local conservative councillor, commented on Walsall's reputation for being the unhealthiest place in Britain.

She referred to the high incidents of cancer and leukaemia in clusters around the waste disposal site and also spoke of an ex-waste disposal site employee who, after twelve years of work had developed throat cancer, and had three tumours and his larynx removed. She called for cross-party support for the closure of Leigh on health grounds (September 1988).

The major complaint against Leigh is negligence, and there is concern about the long-term stability of the Sealosafe system. The environmental health department of the local authority responded by carrying out tests and commissioning research into the increase in asthma deaths into the Walsall area.

The company has been prosecuted for breach of site license. The "outstanding number of prosecutions" and bad publicity surrounding Leigh lead the Caird Group to unload their shares abruptly. Leigh have been prosecuted for over-filling quarries and have taken out an injunction to prevent Environmental Resources Limited from making site inspections.

According to the report, Leigh maintain the attitude that there is no problem. The company hired a new public relations officer to improve the companies image. "Residents find it ironic that the dot on the i of Leigh (on their logo) is a daisy, and that their lorries are painted environmentally-friendly greens and yellows".

There appears to have been no attempt during the years to meet with the protesters, picketers and residents to discuss their grievances. However, Leigh have sent out monthly neighbourhood newsletters to residents calling themselves "good neighbours", to which residents reacted with outrage.

The current situation is that Leigh continue to operate in Walsall as it is not proved that Leigh's activities are prejudicial to health. Unfortunately, the report does not outline the role of the unions in this instance; although the position of the local MSF branch in Walsall has been previously outlined.

Référence n° 3

Safety Issue Raised on N. H. Waste Plan, first edition, Pokorny, Brad. Boston
Globe [Boston Mass]; 4 pages (.doc)

SAFETY ISSUE RAISED ON N. H. WASTE PLAN: [FIRST Edition]

Pokorny, Brad. Boston Globe (pre-1997 Fulltext) [Boston, Mass] (03 Dec 1980): 1. Tarifs

Activer la signalisation des occurrences pour les navigateurs parlants

Résumé (récapitulatif)

Traduire Résumé

The report, which took the form of a memo to Gov. Hugh J. Gallen, states no conclusions. It does, however, point to a number of incidents that state officials say makes them skeptical. "The strength of the Stablex material appeared to be considerably less than the 200 to 800 pounds per square inch figures previously mentioned by Stablex officials," said the report, alluding to a bed of Stablex waste deposited in an abandoned clay mine near West Thurrock, England. "Also, a great deal of cracking of the material was apparent, thus allowing water to infiltrate into the material and therefore raising questions regarding its effect on the curing of Stablex" It details difficulties the state officials say they encountered with Stablex officials in obtaining samples of the Stablex product, a concrete-like substance that allegedly seals in hazardous and toxic wastes for safe burial. The report also told of odors and leaking barrels of waste at Stablex Corp. facilities in England, questioned whether previous laboratory reports about the safety of the Stablex material were objective, and noted the qualms expressed privately by English regulators about Stablex operations in their country.

Texte intégral

CONCORD, N.H. - State planning officials said yesterday that their inspection of the Stablex Corp. facilities in England has raised serious questions about whether the firm's process of treating hazardous waste is safe and whether the company should be allowed to locate a \$10 million hazardous waste treatment plant in Hooksett, N.H. "Stablex has a lot of questions to answer," said State Planning Director Ronald Poltak. "They will have to provide us with the proof that what we found is not the case."

Poltak based his negative assessment on a report he and two other planning officials prepared two weeks ago and released yesterday.

It details difficulties the state officials say they encountered with Stablex officials in obtaining samples of the Stablex product, a concrete-like substance that allegedly seals in hazardous and toxic wastes for safe burial. The report also told of odors and leaking barrels of waste at Stablex Corp. facilities in England, questioned whether previous laboratory reports about the safety of the Stablex material were objective, and noted the qualms expressed privately by English regulators about Stablex operations in their country.

In response, a Stablex official said the report was unfair in comparing company operations in England with the standard set for the proposed facilities in Hooksett, a plan that has not yet received state approval. Hooksett voters will decide at a special town meeting Dec. 19 whether Stablex can locate there. The facility would be located in a 250-acre gravel pit and have the capacity to treat 100,000 tons of inorganic hazardous wastes a year.

John Schofield, president of Stablex Corp. in America, criticized the state for releasing a report without notifying the company in advance of its content, and he accused one of the New Hampshire planning officials on the trip to England of trying to "sneak" a sample of Stablex from a waste disposal site in England.

"I am very disappointed they have seen fit to come out with this report," Schofield said. "The regulations in England are totally different than the regulations in the United States. What you can see in England is totally different to the plant we will be building in Hooksett. It's comparing apples to pears."

The report, which took the form of a memo to Gov. Hugh J. Gallen, states no conclusions. It does, however, point to a number of incidents that state officials say makes them skeptical. "The strength of the Stablex material appeared to be considerably less than the 200 to 800 pounds per square inch figures previously mentioned by Stablex officials," said the report, alluding to a bed of Stablex waste deposited in an abandoned clay mine near West Thurrock, England. "Also, a great deal of cracking of the material was apparent, thus allowing water to infiltrate into the material and therefore raising questions regarding its effect on the curing of Stablex . . ."

Poltak said the cracking and apparent weakness of the Stablex deposited in England led him and the other officials on the trip to have concerns about whether the product will stand up to acid rainfall in New England. Poltak said they feared it could dissolve and perhaps allow the toxic wastes in the Stablex to leech into ground water supplies.

Schofield said the Stablex deposited in England was mixed to different specifications. "We can produce a material to whatever strength we want," he said. "To start throwing direct comparisons is totally wrong." Schofield noted the state of Michigan recently approved permits for Stablex Corp. to build a waste treatment in Groveland, Mich., and said: "We have just been through the most exhaustive examination of any company in the waste treatment industry in Michigan and we came through that."

But New Hampshire officials pointed to the reluctance of Stablex to allow them to bring back to the states samples of the material as a major reason for being skeptical about the process. "Why don't they let us take a piece of this stuff back and test it?" Poltak asked. "All we want to do is see if this stuff works."

Schofield said Michael Donahue, a representative of the New Hampshire Water Supply and Pollution Control Commission, tried to sneak a piece of Stabléx waste into his pocket while touring a plant site in England. "Now what kind of state official is it that sneaks a sample of material?" asked Schofield. Poltak said Donahue did not attempt to "sneak" the material into his pocket. He said Stabléx officials were present when Donahue broke off some Stabléx material and that they prevented him from taking it off the site.

Nombre de mots : 766

Copyright Boston Globe Newspaper Dec 3, 1980

Indexation (données)

Citer

Personnes Poltak, Ronald, Schofield, John, Donahue, Michael

Société / organisation Stabléx Corp

Titre SAFETY ISSUE RAISED ON N. H. WASTE PLAN

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Référence n° 4

Never-ending war of Stubber's Green A group of Walsall residents have won a legal battle against the giant Leigh Interests toxic disposal company. It is a significant victory in a long war against the huge waste site on their doorstep;
· Holderness, Mike. The Guardian [Manchester (UK)] 6 nov 1992; 3 pages
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Never-ending war of Stubber's Green A group of Walsall residents have won a legal battle against the giant Leigh Interests toxic disposal company. It is a significant victory in a long war against the huge waste site on their doorstep

Holderness, Mike. The Guardian (pre-1997 Fulltext) [Manchester (UK)] (06 Nov 1992): . Tarifs

Activer la signalisation des occurrences pour les navigateurs parlants

Masquer la signalisation

Résumé (récapitulatif)

Traduire Résumé

Leigh Interests was prosecuted by Walsall Council at the instigation of a bunch of local residents who have been fighting the toxic waste company for years. Community Action Against Toxic Waste (CAATW) was formed in August 1988. That summer the Karin B wandered the world looking for a port to unload its toxic waste. When news came that it had been accepted by Leigh at Stubber's Green, "within an hour, 200 people - my wife is saying 300 - turned out," says Eric Ward, one of its founder members.

Though one battle has been won, the campaign continues. CAATW will keep pushing [Leigh] on its underground waste and pressing it to fully comply with its site licence for the acid plant. The group is now eagerly awaiting the delayed publication of a report on the health of Walsall residents. As Eric Ward says: "We've only won our case when the site gates are finally closed. Those holes are potential toxic waste dumps: it only needs some ill-informed minister to give approval ..."

Texte intégral

THE SITE is a collection of tanks, 40-gallon drums and heaps of mysterious powders, huddled against a canal embankment in a desolate landscape of clay pits and flattened colliery sites. Downwind an unpleasant metallic taste is left on the tongue from Leigh's acid reclamation plant at Stubber's Green near Brownhills and Walsall in the West Midlands.

The tower where toxic waste was mixed with concrete in a patented brew supposedly to fix it into a leak-proof solid mass stands idle. An inconspicuous pipe disappearing into concrete shows where 1.8 million tons of liquid waste was dumped in disused mines beneath the site between 1966 and 1989, when the workings filled up.

Leigh Interests was prosecuted by Walsall Council at the instigation of a bunch of local residents who have been fighting the toxic waste company for years. Community Action Against Toxic Waste (CAATW) was formed in August 1988. That summer the Karin B wandered the world looking for a port to unload its toxic waste. When news came that it had been accepted by Leigh

at Stubber's Green, "within an hour, 200 people - my wife is saying 300 - turned out," says Eric Ward, one of its founder members.

The first step was to blockade the site gates. "This was the foundation for a real community . . . if you didn't have anything else to talk about, there was always the site," says Mr Ward. There were the spills and fires and red clouds of nitrogen oxides from the acid plant to talk about, too. There were also real fears about health.

"My husband is a chronic asthmatic, since we lived here," says Anita Farmer. "We'd always pointed the finger (at the site), but had no proof . . . It's one thing to know in your heart of hearts where the problem comes from, but it's another to prove it. Maybe one day the law will change so companies have to prove things are safe rather than us having to prove they're dangerous."

In the 1980s a senior council environmental health inspector and a planning officer left for jobs with Leigh. As CAATW sees it, supervision of the site was then hardly obsessive. Now Walsall Council is commissioning a pounds 25,000 study of the underground waste.

June Ward's reaction when the local paper announced last week's Court verdict - that Leigh had falsely claimed its Sealosafe process turned the waste into a solid - was to turn straight to the financial pages. She was jubilant to see Leigh's shares had fallen 11p to 140p that day. As Eric Ward says: "In a sense we're victims of our own success . . . To be frank, things are a lot quieter now - there aren't the terrible smells we had in the past. So I suppose it's good that 40 people still come to public meetings."

So who are these now-seasoned campaigners? CAATW's committee has two Labour supporters, a member of Friends of the Earth, the local Green Party candidate - plus, flying in the face of convention, a Conservative councillor, the Liberal Democrat candidate, five "Tories to the Right of Margaret Thatcher" and a floating voter. Becky Ward is the only active member under 25: "Many are in their 60s, and one stalwart is 88. I get wheeled out as the Voice of Youth."

Though one battle has been won, the campaign continues. CAATW will keep pushing Leigh on its underground waste and pressing it to fully comply with its site licence for the acid plant. The group is now eagerly awaiting the delayed publication of a report on the health of Walsall residents. As Eric Ward says: "We've only won our case when the site gates are finally closed. Those holes are potential toxic waste dumps: it only needs some ill-informed minister to give approval . . ."

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WARREN AND THE WASTE SITE FIGHT; TOWN DISTRUSTFUL; IT CORP. BLAMES NOT-IN-MY-YARD' ATTITUDE: [FIRST Edition]

Andrew Blake Globe Staff. Boston Globe (pre-1997 Fulltext) [Boston, Mass] (01 Aug 1982): 1.
Tarifs

Résumé (récapitulatif)

Although [John Schofield], then a Stablex vice president, told Hooksett residents that the strength of the sealed substance was 200 to 800 pounds per square inch, New Hampshire officials who visited the Stablex plant in England said the strength may be as low as 50 pounds per square inch, a figure that would significantly increase the likelihood that chemicals could be released into the ground.

IT president William D. King in an interview flatly denied any connection, financial or otherwise, between Stablex and IT. Officials point out that Stablex withdrew as a subcontractor for IT's Texas proposal last January. IT spokesman [Peter Morrissey] said the company is negotiating to buy another process which is similar to the Stablex method.

New England, with its manufacturing, jewelry and computer industries, generates about one million tons of hazardous waste annually. Only about 10 percent is processed by local treatment facilities. Instead of going after one portion of the market, IT, in its Massachusetts, Louisiana and Texas proposals, has decided to propose comprehensive plants to recycle, oxidize, incinerate, neutralize and recover chemicals from New England and elsewhere.

Texte intégral

Ever since the tragedy at Love Canal shocked the public into an awareness of the dangers of toxic chemical waste, public groups around the country have mounted passionate campaigns to defeat proposals to build chemical waste treatment plants in their communities.

The town of Warren in central Massachusetts is no exception.

It is in this small community on the Massachusetts Turnpike midway between Worcester and Springfield that the IT Corp. of Wilmington, Calif., wants to construct a \$100 million comprehensive hazardous waste facility, the largest environmental project in state history.

Although well known in California, originally as International Tank Co., this privately-held company was virtually unknown in Massachusetts until June of 1981 when it announced plans for the treatment facility somewhere in the state. That somewhere has now been narrowed to a site in Warren.

The proposal is the most controversial environmental plan in the state. With a projected ability to incinerate, neutralize, recycle or recover up to 500,000 tons of hazardous waste each year, it is the flagship proposal under the state's new hazardous waste facility siting law.

Warren activists say the IT representatives have come on like snake oil salesmen. In trying to stop the facility, local opponents echo complaints of IT critics in Louisiana and Texas - where other IT proposals are pending - who accuse company officials of overstating their own record and of saying different things to different audiences.

But a spokesman for IT says the real basis of the problem is the "Not-in-my-back-yard" syndrome. Local residents have become terrified by revelations of illegal dumping of chemicals into their lakes and rivers, or into dumpsites leaching into underground drinking water supplies, said IT representative Peter Morrissey.

"We've encountered violent protests. People tell us that we're threatening their lives. But when we try to explain our plans, people are so blinded by emotion and fear that they don't listen," Morrissey said.

Disposal, treatment and recycling hazardous waste is big business these days and IT is gambling on nationwide expansion to capture a large chunk of that market, especially in New England.

A Globe examination of the company, prompted both by the controversial nature of the project as well as its magnitude, has concluded:

Citizen groups here and in other states are unanimous in accusing IT of a lack of candor in its claims and presentations.

- Some of IT's claims of sophisticated technical accomplishments are overstated and misleading.
- IT and several state officials are under investigation by the Louisiana State Ethics Commission for alleged impropriety in obtaining land, and for alleged conflict of interest in employing state contractors to approve sites. Should the commission win its case before the state Court of Appeals, IT could lose all of its permits.
- IT has exerted considerable political influence in other states, including sizable campaign contributions to local officials. In Massachusetts, however, hazardous waste siting regulations preclude overt political influence.
- IT has never built a plant of the type and massive size proposed for Massachusetts and Louisiana. In promoting the proposal here, IT officials have indicated such a plant is being built in Louisiana when, in fact, no actual construction has begun there.
- Despite problems with its credibility and some specific problems in operating procedures, there is no evidence to indicate the company cannot build a reliable hazardous waste treatment

facility. Both the state's secretary of environmental affairs and a public interest watchdog group, the Coalition for Safe Waste Management, have endorsed IT's Massachusetts proposal.

IT officials admit the single most difficult problem the company has faced is in the area of public relations. But those officials maintain that - image problems aside - there is nothing to contradict their claims that they can build and operate a sound, reliable toxic waste disposal facility.

Said John Schofield, IT's vice president for development: "The state's siting law provides for a clear, orderly process with mandated procedures and time tables. The law also prohibits communities from rejecting such a facility and that's what angers opposition groups."

IT built its reputation in California over the last half century and now has 26 locations throughout that state which produces about five million tons of hazardous waste annually, about 10 times the output of Massachusetts.

Problems at several California locations have irked citizens, and have resulted in IT being cited for numerous violations and failures to comply with corrective orders.

But California critics agree IT has generally rectified its problems in response to citizen and governmental pressure over the last couple of years.

In Warren, IT still is negotiating for the purchase of land while fighting a legal challenge brought by the town of Warren and citizens from STOP IT, a grassroots group opposing the facility. At the same time, IT and the town are moving through the siting process as mandated under the new state siting law.

In response to charges of lack of candor, IT spokesman Morrissey admitted the firm has had a very difficult time convincing residents of the company's good faith.

The real basis of the problem, Morrissey said, "is the not-in- my-back- yard' reaction of people in communities where facilities are proposed. When we've had meeting with groups - such as environmental organizations - who do not live in the affected community, we've been asked sensible questions and met with very favorable responses.

"But," he added, "when we go, for instance, to a town meeting in Warren to explain our plans, and more than half the people march out, it's very difficult to give an explanation. We are not looking for sympathy - just for a reasonable assessment of what we're proposing."

Warren's Local Assessment Committee, required under the law, has been meeting every Thursday night to hammer out details for negotiations including technical, socio-economic, environmental and legal considerations.

The basic arguments against the IT proposals are the same in Massachusetts from the STOP IT group as they are in Louisiana and Texas. The groups allege IT is not truthful in its dealings with citizens and is gambling with public health and safety through untested technology.

Robert Buck of STOP IT said that their objections to the company's plan, or any company proposing such a facility, "is its gross size, untested technologies, refusal to consider scaled-down alternatives and immediate and long term health hazards."

IT officials have denied that the Massachusetts facility would be the largest in the world, saying their California operations already treat more than what is proposed here. But Warren opponents are quick to point out that while the California facilities are scattered, the Warren operation would combine a number of functions at one site. Company officials respond that, in principle at least, the idea of a centralized, combined facility has been endorsed by the New England Regional Commission.

Warren opponents point to the fact that a model of the Louisiana plant has been shown at public meetings as being "similar" to the proposed Warren site. IT press releases tout the Louisiana project as the largest in the world. But, in fact, no construction on that plant has taken place.

In discussing waste treatment technology, Schofield told the Warren Local Assessment Committee in June that toxic residue that cannot be destroyed or treated would be turned into a concrete-like substance and stored above ground for two years when it could be taken off the federal Environmental Protection Agency's list of hazardous materials.

One patented waste solidification process, called Stablex and developed by a British firm of the same name, was initially promoted by IT for use in its Massachusetts, Louisiana and Texas projects.

But opponents claim the process is unstable and would leak toxic chemicals under a variety of circumstances. An attempt to locate a Stablex facility in Hooksett, N.H., was defeated by residents.

New Hampshire officials said British environmental officials told them of unacceptably high levels of cyanide and phenol in water samples at a Stablex plant in England and that odors from the plant led to a court case after a nearby school was evacuated.

Although Schofield, then a Stablex vice president, told Hooksett residents that the strength of the sealed substance was 200 to 800 pounds per square inch, New Hampshire officials who visited the Stablex plant in England said the strength may be as low as 50 pounds per square inch, a figure that would significantly increase the likelihood that chemicals could be released into the ground.

Schofield, who left Stablex to join IT Corp. about a year ago, has himself been cited by opposition groups as contributing to IT's credibility problems.

IT president William D. King in an interview flatly denied any connection, financial or otherwise, between Stablex and IT. Officials point out that Stablex withdrew as a subcontractor for IT's Texas proposal last January. IT spokesman Morrissey said the company is negotiating to buy another process which is similar to the Stablex method.

The reasons why IT, Stablex and other waste and hazardous chemical processors began their expansion into New England, Texas, Louisiana and other places are obvious.

Until the passage of relatively recent regulations, hazardous waste was frequently disposed in municipal sewers, dumps, unsecured landfills or just a handy place off the side of the road. The EPA estimated that about 90 percent of all dangerous chemical waste was disposed of in this manner before regulations were put into place.

Those regulations took the form of the federal Resources Conservation and Recovery Act of 1976, which took effect Nov. 19, 1980. The act requires a "cradle to grave" tracking system that holds industry responsible for its waste from the time it is generated to the time of its disposition.

The act meant the end of most marginal and unsafe disposal operations. It also meant, according to a Business Week magazine report of Dec. 1, 1980, a potential 10-fold market increase in hazardous waste processing from about \$200 million to \$1.5 billion.

According to Schofield, the plans for the Louisiana site comprise the first major application submitted under RCRA and are being closely watched by industry and municipalities.

New England, with its manufacturing, jewelry and computer industries, generates about one million tons of hazardous waste annually. Only about 10 percent is processed by local treatment facilities. Instead of going after one portion of the market, IT, in its Massachusetts, Louisiana and Texas proposals, has decided to propose comprehensive plants to recycle, oxidize, incinerate, neutralize and recover chemicals from New England and elsewhere.

Such a comprehensive approach has the support of the New England Regional Commission, which in 1979 concluded that a larger regional hazardous waste facility would be more efficient than scattered, smaller, local facilities.

IT opponents around the country have questioned how a company that had \$35 million in gross revenues last year could finance three \$100-million projects. But IT's president King says that as soon as the firm navigates regulatory obstacles, investors will be competing with each other to buy in to the projects.

The Coalition for a Safe Waste Management, a Massachusetts agency that monitors such proposals and provides information to municipalities, reviewed as best as it could the limited financial information available from the privately held company and concluded IT has the financial capability of building the Warren plant if it enters into a financing partnership with 50 percent or more coming from other investors.

The size of IT's Texas proposal still is unclear, although representatives repeatedly have described it as similar in scope to the Louisiana facility. Although the Texas proposal is dormant, it is not yet dead, say officials. But opponents say the delay by Texas authorities may be a blessing in that it frees up more corporate money to concentrate on its Massachusetts and Louisiana initiatives.

Still, local opponents are not convinced that IT's proposed facility will not have serious adverse impact on the environment.

Referring to problems with chemical spills and air emissions in California, STOP IT's Linda Smith worries those problems will also plague Warren - but on a much larger scale since the plant will be larger than anything ever built by IT.

But John A. Bewick, state environmental affairs secretary, disagrees: "Massachusetts regulations are among the toughest in the nation and are far more stringent than federal requirements."

The only treatment facility that will be built, he said, "must be operated and maintained so as to protect public health and environmental quality."

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Référence n° 6
Investigation of Stablex Material Emplaced at West Thurrock Facility, England
– Draft Report, voir p. IV et p. 10 à 12 (hypertexte)

ABSTRACT

In the Spring of 1981, the U.S. Army Engineer Waterways Experiment Station (WES) undertook a field and laboratory study to characterize the treated residue generated at Stablex Limited's facility in Essex County, England. In particular, thirteen cores of the solidified Sealosafe® treated waste were collected from the Aveley Clay Pit and Thurrock Chalk Quarry disposal areas at Stablex Limited's West Thurrock site in England to determine if, under routine waste management conditions, these wastes would degrade with time and leach significant concentrations of toxic heavy metals and cyanide and contaminate the surrounding environment. In addition, samples of surface water, ground water, of uncured Sealosafe® treated waste, and of subwaste rock and soil were also collected at the site to demonstrate the effectiveness of the treatment process used at the West Thurrock facility.

This report describes the methods used in collecting these samples as well as the procedures used, including quality control, and results obtained in testing and analyzing them. The primary testing procedure employed with the cured and uncured treated waste was EPA's extraction procedure (EP). Finally, the report presents a discussion on the analytical results and our conclusions.

SECTION 2

CONCLUSIONS

In evaluating the analytical data on samples collected from Stablex Limited's facility in West Thurrock, England, the following conclusions have been reached:

- ° Extraction Procedure (EP) testing on 52 ground samples of the solidified Sealosafe treated waste shows that the concentration of all the toxic heavy metals in the EP extract with the exception of selenium were at levels below the level set as part of the Stablex delisting decision (i.e., less than 30 times the National Interim Primary Drinking Water Standards (NIPDWS) for the EP toxic metals and less than 20 ppm for nickel). The Sealosafe® material contained maximum lead, chromium, arsenic, barium, cadmium, and nickel levels of 3320, 1100, 635, 1730, 79.1, and 645 ppm, respectively. Thus, the fact that these high total content levels did not leach significant concentrations demonstrates the binding capacity of the treatment residue.
- ° Selenium was shown to leach consistently at levels that are higher than the level set as part of the Stablex delisting decision (i.e., greater than .30 mg/l). Although none of the selenium extract levels exceeded the maximum allowable EP levels, 11 of the 52 samples analyzed met or exceeded EPA's level for delisting. No correlation was found between the amount of selenium leached from the treated waste with its bulk selenium content. Furthermore, there appears to be no consistent pattern relating older to newer, or weathered to unweathered treated waste with selenium release.
- ° Multiple extraction procedure (MEP) testing on five ground samples of the Sealosafe® treated waste indicates that all the toxic heavy metals, except for selenium, leached at levels below the level set as part of the Stablex delisting decision. These tests indicate that the toxic metal contaminants are sufficiently immobilized in the waste matrix. (The MEP was developed to stimulate the leaching effect of long term percolation of acidic rainfall on the waste.) Selenium was the only toxic metal that leached at high levels; it was found in two of the five samples analyzed and further confirms a potential problem of selenium leaching. In both samples (6A and 13B), the highest concentrations were observed in the fifth and sixth extractions.
- ° Quality control checks on an EPA-approved selenium analytical procedure (hydride generation) suggest that this technique may consistently

underestimate selenium concentrations in EP extractant samples by 40 to 60 percent. Thus, more samples with unacceptably high selenium values may have been found had other techniques been employed.

- ° Sixteen samples of the Sealosafe® treated waste from six cores were also tested in a monolithic (or solid) condition using the Structural Integrity Procedure (SIP). The resulting extracts were then composited for each core. None of the composited extracts showed concentrations of the toxic heavy metals at levels above the level set as part of the Stablex delisting decision; in most cases, the toxic heavy metals were present at or below the limit of detection of the analytical techniques employed in the testing.
- ° Two samples of the Sealosafe® treated waste slurry was collected in sealed containers at the waste discharge point and tested after approximately 20 days. With the exception of cadmium, the samples leached very low levels of the toxic metals. This generally indicates that the toxic metals are immobilized in the waste slurry. Cadmium, however, leached in both samples at levels above the level set as part of the Stablex delisting decision (i.e., greater than .30 mg/l); the average level seen in duplicate tests on the two samples was 0.709 mg/l.
- ° Eight samples of the Sealosafe® treated waste were leached with distilled water. In addition, 52 samples of the Sealosafe® treated residue were analyzed for total cyanide and free cyanide (cyanide amenable to chlorination). This data suggests a potential problem with cyanide leaching (although only two of the eight samples leached at levels above the level set in other EPA delisting determinations--namely 2 mg/l) because of the relatively high concentrations of cyanide in the treated waste. Since pozzolonic stabilization processes are not expected to immobilize cyanide, it is important that any cyanide present in the wastes prior to the metal stabilization step be destroyed.
- ° Analyses of the 52 Sealosafe® treated waste samples revealed a total organic carbon (TOC) content ranging from 3,130 to 14,750 ppm (0.3 to 1.5 percent). These levels did not appear to increase the leachability of the toxic heavy metals from the waste.
- ° Ground-water samples collected from the eighteen monitoring wells at the Thurrock Chalk Quarry Disposal area generally indicate little, if any, toxic metal contamination was occurring at the site from the treated waste. Cyanide, however, was present in a number of the monitoring wells at levels above the U.S. Public Health Service suggested drinking water standard. Therefore, unless cyanides are destroyed in the pretreatment process, cyanide leaching appears to be a real problem.
- ° Surface water samples collected at the Aveley Clay Pit generally indicate very low levels of the toxic heavy metals. However, concentrations of some of the toxic heavy metals in the pond at the base of the disposal area were present at levels as much as an order of magnitude higher than the ponds that are west of the emplacement area. Therefore, there appears to be some potential for contamination from the uncured

Sealosafe® treatment residue. This contamination probably results from drainage of the excess process water not used in the polymerization reaction or from leaching of the uncured material that flows into the pond.

°Analysis of samples of the geologic strata (clay and chalk) directly below the Sealosafe® treated waste shows no consistent pattern that could be related to the leaching of toxic heavy metals from the treated waste. This is considered significant in that it indicates that the inorganic constituents are generally immobilized by the treatment process.

Extrait de la référence n° 7
State Of Practice Report Uk Stabilisation/Solidification Treatment And
Remediation: Binders & Technologies – Part III Applications, voir pp.6-8
(hypertexte)

production of calcium carbonate which stabilises and encapsulates the contaminants. The de-calcified binder component is also polymerised in this process and develops a significant sorptive capability which further contributes to the contaminant retention. Significant quantities of gas can be utilised in this process as laboratory results have indicated that the CO₂ uptake can be greater than 50% of the weight of the binder utilised. This would mean that a gas quantity greater than 250m³ could be bound as a solid into each tonne of binder utilised.

COMMERCIAL APPLICATIONS

The Sealosafe process

The Sealosafe process, which is based on a UK Patent, was used by the companies Stablex, Leigh Environmental and Cory Environmental to treat hazardous wastes. The process was introduced in the UK by Crossfield Pollution Services Ltd (predecessor of Stablex) in 1973 and described it as being 'a mechanical-chemical polymerisation process which uses a polymer believed to outlast the contained waste' (Conner, 1993). The process uses cement and pozzolanic materials such as fly ash as the binding material for treating the waste and it was generally considered that all inorganic wastes could be treated unless particular constituents were present at large concentrations (Porteous, 1985). The waste could be in liquid, solid, sludge or filter cake form and typical industrial wastes treated using the Sealosafe process are shown in Table 3.

Any waste prior to being accepted at a Sealosafe plant had to go through a laboratory evaluation, formulation and testing programme to determine its suitability for treatment (Cope et al., 1983; Pojasec, 1979). Accepted wastes were stored in suitable facilities, depending on the form of the waste, until taken for processing. The wastes then go through the preparation stages of mixing and pretreatment. The wastes were generally either mixed in the right proportions or pre-treated by a special process in order for the treatment to be successful. This facilitated a control of the pH of the waste or processes such as oxidation, reduction, complexing or precipitation to render the waste suitable for

solidification (Porteous, 1985). In addition, mixing with other wastes enabled wastes containing large proportions of organic matter, which were normally unsuitable for the Sealosafe process, to be treated and the treatment costs reduced (Chappell, 1980). Subsequently in the main treatment stage, which has also been referred to as the polymerisation stage, the waste stock slurry was combined with the desired amount of the binder, at normal temperature and pressure, to form the final product (Pojasec, 1979; Porteous, 1985). The ratio of cement to the pozzolanic materials used could vary as much as from 50:1 to 1:50, and this variation affected the rate of setting and ultimate compressive strength (Chappell, 1974). The product, which resulted from the treatment, was in the form of a slurry that was either discharged to trucks or pumped to adjacent land reclamation sites. Leigh Environmental used the solidified product to fill marl pits and Cory Environmental used it to fill a disused chalk quarry (Barmpoutis, 2002). The slurry generally began to set within 24 hours, was sufficiently hardened to walk on after 3 days, was capable of supporting vehicular traffic after 1 month, and ultimate strength was achieved after 6 months (Pojasec, 1979).

The properties of the resulting product were assumed to be derived from a combination of two inter-dependent crystal capture mechanisms, which caused its formation (Pojasec, 1979). The two mechanisms involve: (i) formation of strong chemical bonds as a result of the pollutants present in ion form in solution reacting with the process chemicals and (ii) dispersion and entrapment of the pollutants present in the insoluble form within the polymer lattice (Pojasec, 1979). It is stated (Pojasec, 1979) that complete destruction of the product matrix is required in order for the pollutants to leach out and that this would generally require very high temperatures or strong acids.

The assessment of the effectiveness of the process was usually conducted by testing 28-day samples obtained from the processing plant prior to deposition that were allowed to cure within a container open to the atmosphere at 20°C with a relative humidity of not less than 60% (Porteous, 1985). The assessment criteria were based on

permeability, leachability, compressive strength and long-term stability. Typical permeabilities were about 1×10^{-7} cm/s and compressive strengths ranged from 0.7 – 4.0 MN/m². Leaching conducted using the EP Toxicity test (USEPA, 1986) on waste with initial concentrations of heavy metals of up to 100,000mg/kg dry weight depicted leached concentrations well below the levels set in the EP Toxicity test (Conner, 1993; Pojasec, 1979; Porteous, 1985). Long-term stability assessment based on permeability, strength and weathering tests over a six year period indicated improvement in these physical properties over time (Pojasec, 1979; Porteous, 1985).

The Sealosafe process was used in the UK from the mid 1970s to the mid 1990s. The first Sealosafe process plant was built by Polymeric Treatments Ltd (through a licence from Stablex) in 1974 in Brownhills, northwest of Birmingham at a cost of around \$200,000. It was designed to handle small quantities of a wide range of wastes with an initial capacity of 30,000 tonnes per annum, which was to be reached within a few years of operation. By 1977 it was treating 80,000 tonnes per annum (Pojasec, 1979). Two other plants were then built in 1978: one next to the original facility at Brownhills with a capacity of 120,000 tonnes per annum. The other in West Thurrock, 20 miles to the east of London, had a capacity of 400,000 tonnes per annum and was the largest facility in the world at the time to handle hazardous wastes (Pojasec, 1979).

Stablex operated the West Thurrock plant until 1984 when it was taken over by Cory Environmental who continued to operate the plant until the mid 1990s. The reasons for closing the plant are not known but are almost certainly related to the low cost of direct co-disposal of wastes to landfill. The waste types treated by the Cory Environmental plant are given in Table 4 and Figure 3 shows the stages of operation of the plant. Leigh Environmental took over the operation of the two Brownhills plants until 1989, when they lost the license to deposit Sealosafe products as a result of a number of incidents, which raised concerns over the use of this technology. Full details are given by Barmpoutis (2002) and in a number of articles

in ENDS reports (ENDS, 1985; 1989; 1992 and 1995).

In 1984 10,000m³ of a solidified waste deposit burst a containment wall at a Leigh Environmental site. Reports prepared by Harwell Laboratory and Imperial College for the Department of the Environment cast doubts on the reliability of waste solidification as used by Leigh Environmental as an effective treatment and disposal process. It was found that heavy metals and organic materials mixed in the solidified waste could leach out at high concentrations. It was also concluded that 'commercial marketing of these processes included numerous and sometimes exaggerated claims about mechanisms of interaction (within the solid matrix) with 'little scientific support' (ENDS, 1985).

A second incident in 1989, caused Leigh Environmental to lose its license to deposit solidified waste. They had claimed that the Sealosafe process could encapsulate a variety of hazardous wastes in a synthetic rock that was safe, permeable, non-polluting and non-leaching. However Harwell Laboratory performed tests on specimens collected from a Leigh Environmental site and found that the synthetic rock failed to stand up to these claims. The resulting material was soft and had a high liquid content and poor compressive strength. Some samples were highly permeable and leachates from some areas contained high levels of organic compounds. According to Harwell Laboratory, these were indicative of a level of organics in the waste polymer mix, which is unlikely to be compatible with the generation of a product with satisfactory physical and structural properties. As a result Walsall Metropolitan Borough Council refused to allow Leigh Environmental to continue the deposition of the product in a clay pit in Aldridge (ENDS, 1989; 1992; 1995). Leigh Environmental appealed against this decision in 1991 without success. In 1995 the Environment Secretary decided to uphold Leigh Environmental's appeal against the Borough Council after they had been told by the company that the quality of the product which would be deposited in future would be 'far superior' to that of the earlier deposits, and that the material would definitely solidify.

However, the Council still had doubts about this and Leigh Environmental did not use the Sealosafe process again.

The Sealosafe process was also introduced to other countries: in 1976 two plants were built in Japan one near Tokyo and the other near Nagoya and in 1977 the process was introduced to North America, Australia and other European countries (Pojasec, 1979). In 1983 Stablax sited a plant at Blainville near Montreal in Canada with a capacity of 70,000 tonnes per annum which effectively treated a wide range of inorganic wastes (Porteous, 1985). This plant is considered highly effective and is still operating today.

A13: Thames Avenue to Wennington highway scheme

The main site works were carried out in 1995. Approximately 150,000m³ of lightweight fill was obtained by treating about 100,000m³ of lightly contaminated silt dredgings. These were used in embankments on the edge of Rainham Marshes. The dredgings was mixed with PFA at a ratio of 2 parts silt to 1 part PFA and lime added at 3% to the composite mixture, with the aim of modifying the silt to obtain an acceptable fill material. After three years undisturbed samples were obtained and tested. The geotechnical test results showed very little change from the construction data and the material was still within specification limits with no loss in strength. The pH and the leachate had dropped from being strong alkaline at the beginning to slightly alkaline after three years with the other species showing no significant change. These results were similar to those obtained from laboratory and test bed on similar material (Reid and Clark, 2001).

Ardeer Site, Scotland

The first in-situ S/S treatment project in the UK was carried out by Bachy (now Bachy Soletanche) at the ICI Ardeer explosives site in Scotland in early 1995 (Wheeler, 1995; Barker et al 1996; Sansom 2000). This was also the first soil mixing project in the UK for geoenvironmental applications. The site was used by ICI for containing waste resulting from the manufacture of silicones for approximately 40 years. The main concern was that contaminated leachates were

polluting the nearby Clyde estuary and river Garnock. Groundwater within and around the contaminated area was monitored over a ten year period and revealed a steady increase in the concentration of heavy metals and acidity and hence treatment was a high priority. The heavy metal contamination was within a granular landfill with a permeability of 10⁻³m/s.

Various remediation methods were considered. Due to the nature and variety of the contaminants, the hydrological conditions and the amount of material that was to be treated (10,000m³ of waste), soil washing and chemical and thermal processes were not considered suitable. Excavation was also rejected because of health and safety and environmental risks and also difficulties in finding a suitable disposal site. A confinement-based solution in terms of a cut-off perimeter wall was also rejected because of the lack of any near surface impermeable layer within which to key in.

The feasibility of using in-situ S/S, together with Bachy's Colmix process, which uses overlapping and contra-rotating augers, was evaluated by a bench-scale study using typical samples of waste taken from the site (Barker et al, 1996). The aim was to neutralise the acidic wastes by increasing the pH levels to immobilise the heavy metals and hence reduce the permeability. Based on laboratory treatability studies, the proposal was to inject slurry with a pH>12 and an acid neutralisation capacity (being a measure of the buffering capacity of the stabilised waste) value >5meq H+/g at pH 9. This grout, when mixed with the contaminated material produced ground with 28-day laboratory strengths >200kPa and a permeability of <10⁻⁷m/s. The treatability study led to the selection of optimum cement-based grout mixes which contained lime, as a neutralising agent, and PFA, to improve the stability of the slurry and reduce leachability of the treated material. The exact mix proportions have not been reported in the literature.

A successful trial was carried out covering 10% of the proposed treatment area which was essential in refining the construction method, using augers, and optimising the grout mix. This was followed by the full treatment, in which 2407 augered columns

Extrait de la référence n° 8
Hazardous Waste Management Market Pressures and Opportunities:
Background Paper, voir p. 77-79 (hypertexte)

WWTW, but in some cases represent a significant COD load (in one case 50% of total COD input to the works).

AEROBIC TREATMENT

Examples of wastes: Widely used as a component process for dilute waste waters with a BOD <500mg/l, in both dedicated and merchant waste water treatment plants. Contaminated soils, and materials such as organic-contaminated filter aid, can also be treated aerobically in windrows.

Example of Industries: Broad range

Economics: Aerobic biological systems are generally more robust than anaerobic systems, which are sensitive to chlorinated and sulphur compounds, pH and temperature fluctuations and may require a pre-acidification stage.

ANAEROBIC TREATMENT

Examples of Wastes: Many of these processes are applied to industrial effluents and to some organic solid waste.

Examples of Industries: Broad ranging

Economics: Anaerobic biological treatment plants are much less common than aerobic treatment plant in the UK, but more widely used in Europe.

ADVANCED

Traditional aerobic and anaerobic methods are being continually developed by combining pre-treatment (for example, intensive oxidation) with controlling the environment (e.g. support media and temperature) and the types of micro-organisms to produce treatment tailored to particular process wastes.

Examples of Wastes: Broad Ranging

Example of Industries: Broad ranging

DECONTAMINATION

Niche solutions are being developed for specific pollutants, many of which depend on the selection of a suitable strain of micro-organisms.

IMMOBILISATION

Immobilisation involves mixing the waste with other constituents which will set like cement. Ions may react with the added constituents, such as lime, be adsorbed to them or simply be trapped within the solid matrix. The matrix also inhibits the passage of water that could leach soluble materials. Such processes are also commonly referred to as fixation, solidification or encapsulation. Stabilisation techniques are used in the United Kingdom to stabilise soil profiles and slopes and to lock up metal contaminants. The main methods for in-situ rotary mixing by fixed and mobile plant are mechanical and pressure mixing and for ex-situ direct and drum mixing. Such techniques are also used in the USA, France, Germany and the Netherlands.

Examples of waste: Liquid and semi-solid hydrocarbons e.g. paints, viscous solvents.

Examples of Industries: Brownfield land re-development.

Economics: There are concerns about solidification techniques, related to poor performance in the past due to poor control of the waste input quality and/or reagents, leading to failure to meet the desired performance initially or to breakdown with time. Such processes are reversible, that is the immobilised ions can be released, due both to poor process control and to subsequent mixing with other waste types. There is UK experience at the merchant scale (details provided below), though not for the last 10 years or so.

The stabilisation of hazardous and non-hazardous waste has been practised in the United Kingdom since the 1970's when a patented process, the Sealosafe process, was used by the waste management companies: Leigh Environmental and Cory Environmental. Leigh Environmental operated two plants of 80,000 and 120,000 tonnes per annum of waste input and Cory Environmental operated a plant of 15,000 tonnes per annum waste input.

Typically the types of waste treated through this process were: Sulphuric acid, Chromic acid, Al-Chloride solutions, Solid and liquid cyanides, Neutral sludge, Other sludge, Paint washing, Hydrochloric acid, Mixed acids, Fe-chloride solutions, Caustic solutions, Lime sludge, Filter cakes, and Ferrous sulphate.

The Sealosafe process homogenised acid and alkali wastes in mixing tanks and used wastes with high levels of suspended solids to raise solid levels, physically binding contaminants before adding cement. Cement and specialised cements were added before disposing of them to landfill under waste management licence conditions that required the mixture to solidify. The process ceased to be used in this way in the mid 1990's because direct disposal to landfill or other pre-treatment processes were commercially competitive. Commercial pressure resulted in operational experimentation that affected the quality of the material, by way of an example the addition of organics meant that the cement did not cure, and resulted in the breach of licence conditions by Leigh Environmental who were prosecuted under the Trade Descriptions Act.

There is a significant body of research in the United Kingdom at the Department of Engineering of Cambridge University and at Imperial College. The research supports and publicises applications and near market applications and focuses on the application of stabilisation techniques in the management of contaminated soils and hazardous and non-hazardous waste.

Oil and drilling wastes represent a treatment and disposal problem for oil companies. Shell Global Solutions for example, have developed a process known as Shell C-Fix that uses heavy refinery residues as a binding agent prior to stabilising with cement. The purpose of this process is to develop products for use in construction, where water repellent qualities are beneficial, from oily sludge and drilling wastes.

Technology for the treatment of contaminated soils can be applied using two on-site treatments referred to as 'in-situ' and 'ex-situ'. Generally in-situ treatment is undertaken by mixing the soil with binders in the ground whereas ex-situ treatment consists of temporarily excavating the soil, mixing with binders in equipment such as a pug mill and then replacing the treated soil. Both technologies are subject to Mobile Plant Licensing (MPL) requirements. The basic argument made is that where material is treated 'ex-situ', the site is subject to a Waste Management Licence. It is claimed that this places ex situ technologies at an unjustifiable disadvantage. This is against claims that ex-situ methods are actually more robust and easier to test than in-situ equivalents. When put in context, it was found under the USEPA Federal Superfund initiative, 1982 to 1999, that 25 percent of all sites remediated were done so using using stabilisation / solidification; of these sites, 24 percent employed in situ technology, 76 percent used ex-situ technology.

The Centre for Contaminated Land Research at the University of Greenwich, in its evidence submitted to the EFRA Select Committee, stated that the lack of a clear enforcement position for

the 'ex-situ' process of binder-based stabilisation/solidification of contaminated soils poses a threat to the level of brownfield land redevelopment being sought.

THERMAL SYSTEMS

HIGH TEMPERATURE INCINERATION

The incineration process decomposes organic compounds mainly to water and carbon dioxide, other gases and inorganic ash residues. A well designed, maintained and operated incinerator can achieve destruction efficiencies or greater than 99.99%.

Examples of waste: Incineration can handle complex waste mixtures such as household waste or contaminated soil, removing most of the organic material and leaving ash residues for recovery or landfill. In its submission to the EFRA Select Committee, Cleanaway states that 'High Temperature Incineration (HTI) has traditionally been the major disposal route for the most toxic and reactive wastes. Some of these wastes, by-products of chemical and manufacturing processes, are extremely dangerous substances, for which there is no alternative to disposal by HTI'.

Example of Industries: The main areas of current application in hazardous waste management are in the areas of organic chemical wastes and animal and clinical wastes, but they will handle a proportion of inorganic materials, trapping them in bottom ash or flue gas cleaning systems. Mixed laboratory chemicals are often consigned to incineration.

Economics: The economics of HTI have been depressed for a number of years, primarily as a result of wastes going to cheaper alternatives. As a result, capacity has contracted. High calorific value wastes which would ideally be used as feedstock for HTI are going to fuel blending applications, resulting in HTI plant operators having to buy in diesel to maintain temperatures.

These technologies reduce the mass of waste for landfill, facilitate handling and may reduce hazardousness and enhance recovery.

CO-INCINERATION

This technique is predominantly focused on energy containing wastes in the form of a waste derived fuel blended to meet well defined physical / chemical criteria. Efficient destruction of the waste materials requires sufficiently high temperatures, residence time, turbulence and the presence of excess oxygen. Processing conditions within cement kilns result in waste-derived fuels being subject to flame temperatures in excess of 2,000°C, material temperatures of at least 1,450°C, and gas residence times above 1,100°C of between four and five seconds. The minimum residence time for non-gaseous material is about 30 minutes. Cement making requires stable burning conditions and as such all waste-derived materials to be used as fuels are subject to strict compositional control.

It is claimed that any ash from the combustion of the hazardous waste is fixed safely in the glassy matrix of the product clinker. Also, the main emissions of concern occur as a result of the raw materials used in the cement production process, not the fuel used to heat the kiln.

Examples of waste: solvents, oil sludges, distillation residues and tank bottom sludges. The blend in particular is set to meet calorific values and limits on contaminants e.g. chlorine and heavy metals.

The US market has seen cement manufacturers starting to tackle solids with tars and oily wastes put in to suspension prior to combustion. Associated with this practice, there will be advances needed to enable these to be blended, via tanks that continually circulate liquids.

ANNEXE C

Références de cinq brevets de procédés de stabilisation des déchets
Volet 2 : sur l'existence de d'autres installations utilisant le procédé Stablex et
ayant une problématique d'odeur

Annexe C : Résumé des cinq brevets (avec lien hypertexte)

Brevet-1: [Precipitation of toxic metals with silicate and a fixatives](#)

Precipitation of toxic metals with silicate and a fixatives US 5130051 A RÉSUMÉ

A composition for treating toxic metals in solid waste, sludge or slurry is provided. The composition includes a reducing agent such as ferrous sulfate or sodium sulfite and a fixative containing solid calcium oxide or solid magnesium oxide. The composition may also include an acid such as sulfuric acid.

Brevet-2: [Hazardous waste treatment](#)

Hazardous waste treatment US 5997629 A RÉSUMÉ

A method of solidifying a waste or soil composition containing at least one contaminant species which comprises adding to said composition binder and optionally water, mixing the binder into the waste or soil material to form a mixture thereof and simultaneously during formation of the mixture and/or subsequently after formation of the mixture, treating the mixture with sufficient carbon dioxide to achieve setting and subsequent hardening of said mixture so as to produce a solidified waste or soil composition.

Brevet-3: [Method of stabilizing organic waste](#)

Method of stabilizing organic waste US 4514307 A RÉSUMÉ

Method for disposing of (or converting to a construction material) physically unstable wastes comprised of non-biologic, organic, water insoluble compounds, usually dispersed in water, by incorporation thereof in a lime-fly ash water mixture which hardens under atmospheric conditions to form an environmentally acceptable, impermeable, load-bearing material.

Brevet-4: Method of binding wastes in alkaline silicate matrix

Method of binding wastes in alkaline silicate matrix

US 4853208 A

RÉSUMÉ

A method of detoxifying hazardous wastes containing mercury, zinc, selenium, arsenic, antimony, or thallium by mixing the waste with silicate and a setting agent which together form an alkaline silicate matrix. An additive other than the silicate and setting agent is mixed with the waste, prior to the matrix setting, to form a complex with the mercury, zinc, selenium, arsenate, antimony, thallium, or copper that is substantially insoluble in the environment of the alkaline silicate matrix. The alkaline silicate matrix thereby binds wastes which could otherwise leach out to contaminate the environment.

Brevet-5: Cementitious material containing promoter and permeability reducing agent

Cementitious material containing promoter and permeability reducing agent

US 4909849 A

RÉSUMÉ

A method of containing a liquid or semi-liquid hazardous waste found in an organic matrix, wherein the liquid or semi-liquid hazardous waste is mixed with combinations of calcium chloride, calcium formate, glycerine, pentaerythritol, 1,2-propanediol and pluraonic (Synperonic), water, and a cementitious material such as Portland cement, fly ash, or kiln dust. These various mixtures of chemicals, moisture levels and cementitious material solidify to immobilize the constituents in the hazardous waste to reduce the extractability of the constituents from the resulting mixture.

ANNEXE D

Deux références pouvant contenir des informations utiles à la résolution de la
problématique d'odeur

Volet 2 : sur l'existence de d'autres installations utilisant le procédé Stablex et
ayant une problématique d'odeur

Annexe D : Deux références utiles (avec lien hypertexte)

réf-13 : [A Study of the Effects of Post-Combustion Ammonia Injection on Fly Ash Quality: haracterization of Ammonia Release from Concrete and Mortars Containing Fly Ash as a Pozzolanic Admixture](#) (hypertexte)

ABSTRACT

The Clean Air Act Amendments of 1990 require large reductions in emissions of NO_x from coal-fired electric utility boilers. This will necessitate the use of ammonia injection, such as in selective catalytic reduction (SCR), in many power plants, resulting in the deposition of ammonia on the fly ash. The presence of ammonia could create a major barrier to fly ash utilization in concrete because of odor concerns. Although there have been limited studies of ammonia emission from concrete, little is known about the quantity of ammonia emitted during mixing and curing, and the kinetics of ammonia release. This is manifested as widely varying opinions within the concrete and ash marketing industry regarding the maximum acceptable levels of ammonia in fly ash. Therefore, practical guidelines for using ammoniated fly ash are needed in advance of the installation of many more SCR systems. The goal of this project was to develop practical guidelines for the handling and utilization of ammoniated fly ash in concrete, in order to prevent a decrease in the use of fly ash for this application. The objective was to determine the amount of ammonia that is released, over the short- and long-term, from concrete that contains ammoniated fly ash.

The technical approach in this project was to measure the release of ammonia from mortar and concrete during mixing, placement, and curing. Work initially focused on laboratory mortar experiments to develop fundamental data on ammonia diffusion characteristics. Larger-scale laboratory experiments were then conducted to study the emission of ammonia from concrete containing ammoniated fly ash. The final phase comprised monitoring ammonia emissions from large concrete slabs. The data indicated that, on average, 15% of the initial ammonia was lost from concrete during 40 minutes of mixing, depending on the mix proportions and batch size. Long-term experiments indicated that ammonia diffusion from concrete was relatively slow, with greater than 50% of the initial ammonia content remaining in an 11cm thick concrete slab after 1 month. When placing concrete in an enclosed space, with negligible ventilation, it is recommended that the ammonia concentration in the concrete mix water should not exceed 110 mg NH₃/L, if the NIOSH exposure limit of 25 ppm in the air is not to be exceeded. If even a modicum of ventilation is present, then the ammonia concentration in the concrete water should be less than 170 mg/L. The maximum level of ammonia in the fly ash can then be calculated using these limits if the concrete mix proportions are known.

In general, during the mixing and placement of ammonia-laden concrete, no safety concerns were encountered. The only location where the ammonia concentration attained high levels (i.e. > 25 ppm in the air) was within the concrete mixing drum.

réf-14 : PROCESS FOR OBTAINING AMINES BY REDUCTION OF AMIDES (hypertexte)

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Priority Data:

Title (EN) PROCESS FOR OBTAINING AMINES BY REDUCTION OF AMIDES
(FR) PROCEDE D'OBTENTION D'AMINES PAR REDUCTION D'AMIDES

Abstract:

(EN) Disclosed is a process for the preparation of primary, secondary and tertiary amines via a catalytic hydrogenation of unsubstituted, N-substituted, and N,N-disubstituted amides. The amide is led, together with an auxiliary amine, in vaporised form in a hydrogen containing gas flow over the catalyst. The process can be carried out at relatively low pressures, between 2 and 50 bars, using typical hydrogenation catalysts like CuCr-type catalysts. The amine is obtained with high yield and high selectivity. The process can be carried out in a continuous fixed bed reactor.

(FR) L'invention concerne un procédé de préparation d'amines primaires, secondaires et tertiaires par hydrogénation catalytique d'amides non substitués, N-substitués, et N,N-disubstitués. L'amide est acheminé, avec une amine auxiliaire, sous forme vaporisée, dans un flux gazeux contenant de l'hydrogène, au-dessus du catalyseur. Ce procédé peut être effectué à des pressions relativement faibles, entre 2 et 50 bars, en utilisant des catalyseurs d'hydrogénation usuels, tels que des catalyseurs de type CuCr. L'amine est obtenue avec un rendement et une sélectivité élevés. Le procédé peut être effectué dans un réacteur à lit fixe continu.

Designated States: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, , ...