



1971

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

Parliamentary Standing Committee on Public Works

REPORT

relating to the proposed construction of

CENTRAL ZONE SEWERAGE SCHEME

at

Darwin Northern Territory

(FIFTEENTH REPORT OF 1971)

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

CENTRAL ZONE SEWERAGE SCHEME
DARWIN

R E P O R T

By resolution on 25 August 1971, the House of Representatives and on 26 August 1971, the Senate, referred to the Parliamentary Standing Committee on Public Works for investigation and report to the Parliament, the proposal for the construction of the Central Zone Sewerage Scheme at Darwin in the Northern Territory.

The Committee have the honour to report as follows:

THE REFERENCE

1. The proposal referred to the Committee is for the construction in the Central Sewerage Zone of Darwin, sewers, pumping stations, rising mains and a comminutor station terminating in a marine outfall off East Point.
2. The work is estimated to cost \$3.2 million.

THE 1969 REFERENCE

3. Outline In a report tabled in the House of Representatives on 14 May 1969, the Committee reported to the Parliament on the reference "Augmentation of Sewerage Services, Darwin, Northern Territory".

That reference comprised

- in the Northern Sewerage Zone, a main trunk sewer, a pumping station and rising main and treatment lagoons at Leanyer Swamp; and
- in the Central Zone, substantially the same works which make up the present reference.

The purpose of these facilities was to relieve overloading of the existing sewerage services in areas generally to the north of the city of Darwin and to meet future developments in these areas. Their estimated cost in 1969 was \$4.55 million, of which the Central Zone works were expected to cost \$2.75 million.

4. The report traced the development of the first communal sewerage services for Darwin and noted that the increasing volume of sewage created by Darwin's rapidly growing population had been dealt with generally by more intensive use of the facilities provided initially and by progressively extending them. It went on to conclude that in view of the continuing nature of population growth, there was a need to replan Darwin's sewerage services.

5. The replanning proposals outlined to the Committee comprised three main zones, namely

- the City Zone, embracing the main commercial area, Larrakeyah and Kahlin being bounded on three sides by the harbour and on the north by Palmerston and Stuart Parks;
- the Central Zone, which includes Fannie Bay, Parap, Ludmilla, Stuart Park, Bagot, Coconut Grove, the western part of Millner, the R.A.A.F. area, the Winnellie industrial area, and adjoining areas east to the Coonawarra naval station and housing complex; and

- the Northern Zone, covering the Nightcliff district suburbs of Nightcliff, Rapid Creek and the eastern section of Millner and new residential development east of Rapid Creek, including the Casuarina, Dripstone and Sanderson districts.

6. It was noted that there had been some improvements to services in the City Zone to keep pace with development. The culmination of this work was the construction of a marine outfall off Doctors Gully at Larrakeyah discharging comminuted sewage two-thirds of a mile off-shore. This phase of the work was not the subject of a reference to the Committee.

7. Northern Zone The Northern Zone augmentation initially covered the Casuarina sub-divisions of Alawa, Jingili, Moil, Wagaman and future sub-divisions east of Rapid Creek in Dripstone and Sanderson. The urgency of the need for the services for Wagaman and subsequent development was mentioned in the 1969 report and also in the Committee's report presented in 1968 on the Moil sub-division proposals.

8. The 1969 report stated that for the part of the zone west of Rapid Creek, it was proposed to retain the existing system terminating in the Seabreeze marine outfall off Nightcliff which had then recently been extended to about two-thirds of a mile. The new work was to commence with a gravity trunk sewer in Moil proceeding through Wagaman and the eastern part of the Dripstone District discharging into treatment lagoons at Leanyer Swamp, over a mile from the nearest housing.

The plan was to collect by gravity from areas above the level of the trunk sewer. From areas below the sewer, it would first flow by gravity to a pumping station east of Rapid Creek and thence be pumped through a rising main to the trunk sewer.

9. The treatment lagoons at Leanyer were planned to be developed in stages. The first stage was designed for a population up to 20,000. Subsequent stages were to be added as required, ultimately servicing a population of 60,000 or more. The design was to permit the absorption of the sewage from areas west of Rapid Creek when the Seabreeze outfall is phased out of operation.

10. The work on the Northern Zone phase of the proposal has now virtually been completed and the lagoons at Leanyer Swamp are in use.

CENTRAL ZONE SCHEME

11. 1969 Proposals In its report in 1969 on the Central Zone scheme, the Committee described the proposed work in the following way.

" The Central Zone The scheme for the Central Zone envisages collection and disposal of sewage after comminution through a deepwater marine outfall at East Point.

The outfall is to be designed to prevent bacterially harmful or visible material finding its way back to the shore after discharge. However, the proposal is flexible to the extent that, as a safeguard, an area of land is being reserved near the comminutor site to permit further treatment should it be found necessary. It was made clear to the Committee that comprehensive testing of the receiving waters will be conducted

after the outfall is completed to ensure that it is operating satisfactorily.

Sewage will be collected from the sub-areas within the zone and delivered to the main trunk sewer either by gravity flow or pumping. Where possible existing pumping stations will be eliminated but new stations are proposed at Winnellie, Stuart Park and Coconut Grove.

Processing of the sewage by comminution before outfall through a diffuser outlet is considered desirable to facilitate the breakdown, dilution and oxidation of its solids content.

The deepwater marine outfall proposed will differ significantly from the shallow water outfall at Seabreeze Point. Generally, it involves the transport of sewage by pipeline well out to sea to such a depth that pollution does not find its way back to the shore. The usual result is dilution and settlement of waste materials accompanied by oxidation and die-off bacteria although in some instances local conditions cause the sewage to remain at depth.

This compares with the disposal of sewage in shallow water. This is generally acceptable only where its volume is small compared with the body of water into which it is discharged and where either public access to the outlet area is limited or where the movement of tides sweeps the area clean, often enough to prevent harmful aggregations of pollution.

The effectiveness of an outfall such as that proposed depends largely on the relative quantities of salt water and sewage and on the tidal currents. Darwin is generally favourably placed in both of these respects, having a relatively small population and a large volume of sea water surrounding it, subject to wide ranges of tide.

The outfall at East Point is to have a capacity for 45,000 people, although initially the population served by the installation is potentially only 19,000. Studies in 1964 suggested that East Point would provide a satisfactory deepwater marine outfall disposal point for a population in excess of 60,000 and possibly as high as 300,000. Studies are now in progress to evaluate this assessment. "

12. In describing the alternative methods of disposal considered before deciding to support the marine outfall concept, the Committee commented as follows about lagoon treatment.

" Lagoon treatment would have been the most economical but had the undesirable feature that large water areas at Ludmilla could have become feeding and resting places for birds. As the lagoons would need to be near one of the flight funnels of Darwin Airport and the bird-strike hazard would be thereby increased, the proposal was abandoned. The possibility of odour near built-up areas was a further factor against lagoons. This objection also applied to the other forms of treatment considered. "

13. The Committee supported the construction of the Central Zone works as proposed but commented in general terms that in considering the alternative methods of treatment and disposal, it was necessary to strike a balance in which due regard is given to the aesthetic, health, engineering and economic factors. The Committee felt that this had been achieved and that the facilities proposed would provide a satisfactory basis for the disposal of Darwin sewage both in the short and long term. The report went on

" From the evidence taken, the Committee firmly believe that the deepwater marine outfall at East Point will be able to satisfactorily dispose of the sewage from the Central Zone without nuisance or hazard to the public. It is acknowledged that this view may not necessarily be shared by all and that there will be some people who, being mindful of the shortcomings of the present facilities, will be apprehensive about the possible pollution of the waters and foreshores of Darwin harbour and the resulting health risks.

The fact that the flow of sewage through the shallow water outfall at Seabreeze Point will be considerably reduced when the northern zone system is operating and that the small overloaded units discharging into Darwin harbour at various points will no longer be used, can, in our opinion, only mean a large improvement in the present situation. There is, furthermore, the safeguard being designed into the system to provide biological treatment facilities in the remote event that the installation does not perform as expected. There can thus

be little basis for comparing the existing conditions with those which will prevail when the work is completed. "

Subsequently, Parliamentary approval was obtained for the works to proceed and tenders were invited but work has not been commenced.

14. Present Reference The work now referred to the Committee is in essence the same as the Central Zone works examined in 1969. There is one difference in that the route of the outfall to the discharge point has been changed to run across Fannie Bay rather than commence from East Point. The terminal point at about 10 fathoms, 8,000 ft off East Point remains the same. The estimated cost of these works is now \$3.2 million, an increase of \$450,000 over the estimated cost in 1969.

15. The Committee noted that the work has been referred to the Committee again because of persistently strong concern expressed publicly in Darwin since early this year that the proposed scheme will not provide a satisfactory means of disposing of sewage from the Central Zone. Criticisms made of the scheme touch on the possible health hazards associated with discharging sewage into Darwin harbour, the likely pollution of the harbour, the long term ecological effects the outfall might have and aesthetic factors.

16. The Government considered that the reference of the work to the Committee for further review was prudent, notwithstanding the urgent need to proceed with the work, and would give the people of Darwin an opportunity to put forward their views under oath and be questioned on their opinions.

THE COMMITTEE'S INVESTIGATION

17. The Committee received written submissions and drawings from the Department of Works and the Northern Territory Administration. Public hearings were held in Darwin between 20 and 23 September at which evidence was taken from representatives of these departments, the Department of Health, the Northern Territory Port Authority, the Corporation of the City of Darwin and a number of non-official witnesses representing community bodies or appearing in a private capacity. The public hearings were concluded when supplementary evidence from the Department of Works was taken at a meeting in Canberra late in October. In all, 31 witnesses appeared before the Committee.

18. During the visit to Darwin, the Committee inspected by launch, the Doctors Gully and Seabreeze outfalls and the site for the East Point outfall. We also examined the comminutor station and outfall at Doctors Gully, treatment facilities draining into Ludmilla Creek, the Seabreeze outfall and the treatment lagoons at Leanyer Swamp.

THE EVIDENCE

19. The Departmental Evidence The written evidence submitted to the Committee by the Northern Territory Administration and the Department of Works on this occasion restated the case submitted at the 1969 enquiry and reaffirmed the concern of the Government to minimise pollution of the environment and at the same time to safeguard the public health. It was stated that careful consideration had been given again to the proposal and to advice provided by experts inside and outside the Government and that the scheme as proposed, including the marine outfall, was considered to be the most suitable in the circumstances.

20. The representatives of the Department of Health reaffirmed that from the public health viewpoint, the scheme was acceptable providing always that it was sufficiently flexible to permit the subsequent provision of treatment facilities in the event that the scheme does not provide the results expected.

21. As part of its evidence, the Department of Works outlined a number of alternatives to the marine outfall proposal which appeared to have public support, discussed their respective features in a general way and gave an indication of the cost of each. These alternatives were

- addition of primary treatment to the marine outfall (extra cost \$1.0 million);
- addition of secondary treatment to marine outfall (\$1.7 million);
- reticulation of Central Zone sewage to Leanyer Swamp for primary and secondary treatment and discharge of effluent through a shallow marine outfall (\$1.8 million).

22. For the final hearings in Canberra, the Department of Works was asked to re-examine the possibility of building treatment lagoons in the Ludmilla/East Point area. This was done and it was found that the cost would be between \$1.0 million and \$1.6 million more than the marine outfall proposal, depending upon the size of the population provided for. The Department also again examined the possibility of pumping sewage to Leanyer Swamp and as a result confirmed the preliminary cost of that alternative. It also proposed for consideration a scheme involving the pumping of sewage from the Central Zone to Reichardt Creek for treatment there. The cost of the latter was estimated to be some

\$1 million more than the marine outfall. As a result of these final investigations, it seemed to the Committee that the Department of Works was less firm in its support of the marine outfall proposals.

23. Non-Official Evidence The evidence submitted to the Committee from non-official sources came from a wide spread of community organizations and from a number of individuals. Without exception, this evidence was opposed to the marine outfall concept and in general terms it was founded on either health, aesthetic, pollution or ecological considerations.

24. Some evidence based on the present state of the water in Darwin harbour assumed that conditions could only deteriorate, notwithstanding that the scheme as proposed would eliminate small overloaded units discharging sewage in various states of treatment into Darwin harbour and was primarily aimed at improving the present situation. Other submissions discussed the possible future consequences of the discharge of untreated sewage into Darwin harbour mostly from the point of view of the public health hazard and the short and long term pollution of the environment and its effect on the ecology of the area.

CONCLUSIONS AND RECOMMENDATIONS

25. Predictably, the Committee had difficulty in objectively examining and evaluating the evidence from the opposing factions. On the one hand, expert engineers, experienced in the field, expressed support for the proposed work, confident that not only would it

radically improve the present unsatisfactory situation but would also most certainly provide an almost nuisance and hazard-free facility. There was, of course, no proof or guarantee that this would be so but the proposal was flexible to the extent that it could be improved by the addition of treatment facilities at an additional cost of \$3.1 million if the material being discharged became a nuisance.

26. The evidence of non-official witnesses came from those who were apprehensive about the variety of dangers and problems which they were convinced would occur if the proposed scheme were implemented. Their views appeared to be backed by a considerable body of documentation and widely held authoritative opinion about the long term problems of environmental contamination and ecological damage. In this case also there was some difficulty in knowing with any precision how or whether these views had a direct application to the Darwin situation.

27. It did become clear, however, that there is a recently developed but widespread public awareness and apprehension of the dangers of pollution of the environment and it was found that the standards and principles which applied a decade ago to the design of a sewage disposal scheme may be quite unacceptable to the public today.

28. In considering the evidence, the Committee were conscious of the shortcomings of the present overloaded disposal units discharging

effluent into Darwin Harbour and of the extent to which this situation will be aggravated by further delaying the provision of an effective sewerage service. We also recognised that

- the Committee's basic task was to consider the expedience of carrying out the Central Zone works as proposed; and
- that the Department of Works' investigation of alternative methods of disposal of effluent from the Central Zone had not yet been carried out in a form which would enable it to make a considered judgment on which would be the best scheme if the marine outfall was unacceptable.

29. At the same time, we also agreed with the view of the Department that the proposal to construct treatment lagoons in the East Point/Ludmilla area could not be a satisfactory alternative because of the potential odour problem and due to construction and town planning difficulties.

30. The following is an extract from the minutes of the meeting of the Committee which followed the final public hearing and a debate on the evidence.

" It was moved Mr. Fulton, seconded Senator Jessop

That the Committee report to the Parliament that it is not expedient to proceed with the proposal as submitted; and

That the Government should reconsider the means of treating and disposing of sewage from the Central Sewerage Zone, Darwin including

- linking the Central Zone with the Northern Zone treatment facilities at Leanyer Swamp;
- construction of biological treatment facilities in the East Point/Ludmilla Creek area;
- construction of Central Zone treatment lagoons at Reichardt Creek.

Debate ensued.

The Committee divided.

<u>Ayes</u>	<u>Noes</u>
Mr. Fulton	Mr. Kelly
Senator Jessop	Mr. James
Senator Cant	Mr. Whittorn
Senator Webster	
Mr. Corbett	
Mr. Johnson "	

31. In accordance with this resolution, therefore, the recommendations of the Committee are that

- (i) it is not expedient to proceed with the proposal as submitted; and
- (ii) the Government should reconsider the means of treating and disposing of sewage from the Central Sewerage Zone, Darwin including
 - linking the Central Zone with the Northern Zone treatment facilities at Leanyer Swamp;
 - construction of biological treatment facilities in the East Point/Ludmilla Creek area;

15.

- construction of Central Zone treatment lagoons
at Reichardt Creek.



(C.R. KELLY)
Chairman

Parliamentary Standing Committee on Public Works,
Parliament House,
CANBERRA, A.C.T.

9 November 1971.